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MADRAS JOURNAL

OF

LITERATURE AND SCIENCE.

No. 11.—NEW SERIES.

May, 1861.

*Biographical Memoir of Dr. Rottler.* By the Revd. T. Foulkes, *Church Missionary Society, Madras.*

To few of the present generation is it known how much Indian Natural Science owes to a little group of foreign Missionaries who worked together at Tranquebar, towards the close of the last century. Distributing its different branches amongst themselves, they proceeded to make themselves acquainted with a field hitherto unexplored. On the Western Coast a great, though unscientific work had already been done by Van Rheede, in the end of the seventeenth century. In the Northern parts of the Peninsula also, as well as in Bengal, Dr. Roxburgh was, at the time when König, and Klein, and Heyne, and John, and Rottler were at work at Tranquebar, busily employed upon his Coromandel Plants, and his Flora Indica: and it is probably not too much to say that those splendid writers owe not a little to the aid afforded towards their compilation by the Tranquebar Missionary naturalists.

The results of the labours of these indefatigable men are not represented by any separate publication; and hence notwithstanding their large contributions to more than one work now advanced into standard work of reference on Indian Botany, the labours are too nearly being forgotten. How little, for in-

stance, does the name of Dr. Rottler deserve being omitted, as it is from "that illustrious series of Botanists" to whose labours Drs. Hooker and Thompson pay so well deserved a tribute of praise in the Essay Introductory to the Flora Indica, *p.* 47. Rottler has indeed in one direction perpetuated the labours of his friends and his own : his Tamil Dictionary contains a very extensive list of the vernacular names of South Indian Plants, with the technical names by which they were known attached, not a few of which were of his own choosing : and this list will be found to be of very considerable help to Botanists in identifying the plants prescribed in the earlier writers on Indian Botany ; and it is in many instances more serviceable than the imperfect drawings in some of those writers, which are too apt to mislead.

Dr. Rottler's name has also some interest attached to it in connexion with the Madras Literary Society, which in its earliest days considered it not unworthy to be placed on its list of Honorary Members. Connecting this fact with his services in cause of Indian Literature and Science, a notice of his career will scarcely be out of place in the pages of this Journal.

The Reverend John Peter Rottler,* arrived in India in the year 1776, when the last of the earliest group of Danish Missionaries at Tranquebar had passed away from their lobours, after some of them had celebrated a full jubilee in the land of their adoption.† He was then in his 27th year, having been born at Strasburg in June 1749. He commenced his education at an early age at a private School, and when he was in his ninth year he became a pupil of the Strasburg Gymnasium, or Grammar School. The pious Dr. Lorenz was the master of the School, to whom Rottler's future destiny owed its direction. In 1766, when in his seventeenth year, he entered the University of Strasburg, where he continued his studies for nine years, his former master at the Gymnasium being at the time among its professors. Dr. Freylinghausen, Director of the Orphan House and Missions at Halle, intimated at this time to Dr. Lorenz the wish of the Society of Denmark to send two new Missionaries to

* For information relating to the earlier career of Rottler, I am indebted to the Reverend F. M. N. Schwartz, of the Leipsig Missionary Society.

† Hough's Christianity in India, iii. 330.

Tranquebar; and by him Rottler and his companion Gerlach were selected for that work. After a short visit to the Director at Halle, they proceeded to Copenhagen, where they received ordination from Dr. Haubrœ, the Bishop of Zealand on the 3rd of November 1775, they sailed for India shortly afterwards, and arrived at Tranquebar on the 5th of August 1776.

Dr. Rottler's Indian Career extends over close upon sixty years, the first half of it having been spent at Tranquebar, and the latter half at Madras.

Dr. König,* who had been a pupil of Linnæus, and who was already an accomplished Botanist, had preceded Rottler in the mission by nearly ten years: he also found there M. M. Klein and John, two others of the naturalist group, the latter of whom had already been at Tranquebar six years.† The elder Kohlhoff was at the time the patriarch of the mission, having been in India since 1737, but owing to his great age and infirmities, M. Zeylin had succeeded him in the superintendence. Swartz had at this time firmly laid the foundations of his subsequently great influence at Tanjore and Trichinopoly.

Rottler appears to have given himself earnestly to the acquisition of the Tamil Language from the time of his arrival in the country; and he is said to have preached his first vernacular sermon after less than a year's study. His name is not frequently to be met with during the first few years of his work in India. We find him making missionary tours here and there in company of one or other of his fellow-labourers: and his Journals of these tours are said to abound with the technical names of the plants which he met with, to the study of which he had already become warmly attached.

From a letter written in 1779, apparently to a friend at Ramnad, it would seem that Rottler had already made some progress in the study of English. It contains the following characteristic passage;

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* Besides the naturalist, who was for a while the Medical adviser of this Mission, and not ordained, there was at the same time a Missionary of the same name in holy orders at Tranquebar. In the documents that I have consulted the accounts of these two individuals seem to be hopelessly intermingled. The Clergyman died in 1795, after 27 years residence in India.

† Hough, iii. 326, 7.

"If Wisnarasy has still some cash from me in hand, and you will be pleased to send him for making a collection of shells, &c., &c., it will give to Mr. John and to me great satisfaction."

This letter contains the first mention that I have met with of the name of Mrs. Rottler; I believe he married her in this very year; and he probably paid a visit to Cochin for the purpose: for she is said to have been a Dutch lady residing at that place, and the widow of the Captain of a Dutch ship. Mrs. Rottler died at Vepery of cancer in 1827, at the advanced age of seventy-four. The marriage does not appear to have had any issue.

In the year 1788 Rottler made an excursion to Ceylon; probably, as had been the case with others of the Tranquebar Missionaries, from Baldæus, whose tree-church used to be shown to strangers quite recently at Point Pedro, down to Dr. John, who made the same journey in 1779, with the intention of paying a tour of visits to the languishing Dutch Churches of the north of the island, whose spiritual wants had come to be very inadequately provided for.

It was at about this period of Rottler's life* that he became known in Germany, with some of his fellow-writers in the same field, in connection with his botanical researches: several enquirers into the natural resources of India in different parts of the country were in active Correspondence with each other,† laying the foundation of what has since been done in the direction, and in some respects tolerably exhausting their subjects. Many of these names have now become illustrious: they were Jones, Fleming, Hunter, Anderson, Berry, John, Roxburgh, Heyne Klein, Buchanan, Hamilton, Russell, Norton, Shuter, Govan, Finlayson, and Rottler. Dr. König had already during his visits to different parts of the Continent of India and to Siam and Ceylon given a direction to their enquiries: and his name, together with four others in the above "illustrious series," are found in the annals

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* For nearly all the infomation in this paper in connexion with Rottler's Botanical pursuits, I am indebted to my friend Dr. Hugh Cleghorn, at whose suggestion I undertook to prepare this memoir.

† See Wight and Arnott's Prodromus, Preface p. xi. and Hookar and Thompson's Flora Indica. Preface, p. 47.

of the Tranquebar Mission. These latter were also in correspondence with Dr. Schreber, professor of Natural History in the University of Erlangen. To him Rottler constantly forwarded specimens of the South Indica Flora, which were much valued on the continent, and turned to good account. It was apparently through the professor's good offices that in 1795, the University of Erlangen conferred upon Rottler in common with Mr. John, the degree of Doctor in Philosophy.

It is known* that a somewhat extensive collection of Dr. Rottler's plants exists to the present day at the Royal Herbarium at Munich,† and it does not seem unlikely that the collection was removed from Erlangen to the capital, when the former became incorporated with Bavaria in 1810. Another collection‡ of Rottler's plants forms at the present time a portion of the Musée Botanique of the renowned M. Benjamin Delessert at Paris. A third was purchased¶ at Madras by Dr. Wight: the plants in which are referred to in Drs. Wight and Arnott's Prodromus Floræ Peninsulæ Indicæ Orientalis. Rottler's own private Herbarium forming his principal collection, upon which he appears to have worked up to the time of his death is in the possession of King's College London; the plants in which are accompanied by ticketed descriptions in full in the Doctor's own handwriting. A fourth, containing also plants collected by Klein and Heyne, is in the East India Company's Museum.§

Some of Dr. Rottler's contributions to Botanical Science are also to be found in Dr. Heyne's 'Tracts Historical and statistical on India.' Heyne's own attention had now been particularly directed

* Kew Miscellany for March 1851: and Musée Botanique, de M. Benjamin Delessert, p. 557.

† In Martin's Sketch of the Royal Herbarium at Munich, the following passage occurs.

"More considerable contributions were made by the Danish Missionaries at Tranquebar, John and Rottler, the pupils of König; together with those of Burmann from Ceylon, they form one of the most important parts of the Schre-berian Herbarium."

‡ Musée Botanique, de M. B. Delessert, p. 502, 3.

¶ Wight and Arnott's Prodromus, Preface p. xix.

§ Wight and Arnott's Prodromus, Preface, p. xvi.

to the Geology of the Peninsula : and he states* in the preface to his Tracts that the Botanical names which occur in them were given on the authority of Dr. Rottler, for the correctness of which he strongly vouches.

It was not merely as a collector of plants that we find Rottler aiding in the study of Botany ; his scientific descriptions of the plants which he distributed were accepted, by European Botanists, and published in their notes, more especially by Willdenow.†

It is no disparagement to find that he was surpassed in this respect by those Botanists who devoted their exclusive attention to the science in the midst of much more favorable circumstances.

Dr. Wight says:—" The plants distributed by Rottler were in Part characterized very imperfectly by himself in the 4th Volume of the Nova Acta Acad. Nat. Curiosorum of Berlin, published in 1803. Others were described by Willdenow, Vahl and Smith ; and frequently a new name has been bestowed without any regard to that given by Rottler' ‡

The esteem of Dr. Roxburgh has also perpetuated the name of Rottler in another shape, (See his Flora Indica, iii. 827,) by giving that name to one of the numerous genera of the Euphorbiceœ, containing according to Dr. Lindley's || list two sub-genera; and embracing in Buchanan Hamilton's Herbarium,¶ eleven distinct Indian species, one of which Rottlera tinctoria is in great request in India, especially amongst Mahomedans, for dyeing purposes, and as an article of commerce, and is still farmed by Government. Bridil has also given Rottler's name to one of the subgenera of the Bryaceœ.§

The name ' Rottlera' was also given by Vahl†† to one of the Cyrtandraceœ: but this has since been superseded.

Rottler suffered much in health during the early years of his re-

* Preface p. viii.

† Willdenow's Edition of the Species Plantarum of Linnæus.

‡ W. and A. Prod. Pref. p. xii.

|| Vegetable Kingdom, p. 281.

¶ Now in the Botanical collection of the University of Edinburgh.

§ Vegetable Kingdom, p. 67.

†† Enumeratio v. 187.

sidence in India, and had on more than one occasion to lay aside his Missionary work, and to seek in relaxation and change of circumstances a restoration of his failing vigour. It was during an absence of this description that he paid his first visit to Madras in 1793. He remained there however for only a few months; and after accompanying Mr. Gæricke to Vellore to dedicate a Chapel lately erected there at the expense of Mr. Torriano, he returned to Tranquebar. At the close of the same year we find him again in ill health and paying a visit to the venerable Swartz at Tanjore, and amusing himself with the plants in that missionary's gardens. The following extract from a letter written while there apparently to his fellow missionary Jænecke, shows the direction in which his mind constantly turned.

"Mr. Swartz loves trees. He has in his garden shaddock, orange, and lemon trees, some of these in full bearing: likewise the moringa, the cotton, entire avenues of moringa, tamarind, and teak trees, besides several others. Nor are flowers, and flowering shrubs forgotten. There is the bignonia, the michelia, champaca, the guettarda, miminsops, plumina alba, gardenia florida, myrtles, roses, and several kinds of mycthanthis. Besides these I found here the ixora alba, and as a great variety, a small olive tree, and the ixora chinensis. A fine hedge of the justicia picta, (called by the Moors " the smiling leaf,") is a great ornament. To this large garden is attached a kitchen garden, parted off from it by a line; and which supplies the table almost all the year through. The garden contains but two species of palm, the cocoa, and the areca palm; the date-palm, is, however, very common round Tanjore. It has also vines."

Two subsequent journeys afforded ample scope for his botanical predilections, and added to his European reputation. In the Nova Acta Acad. Nat. Curios. of Berlin, printed in 1803, are to be found Rottler's Botanical Notes on the journey from Tranquebar to Madras by Wandewash to Cuddalore and Tranquebar from 29th Dec. to 16th Jan. 1800, with remarks on the plants observed during his stay at Madras in the Botanical Garden at Marmalong under the charge of Mr. D. Berry."

At the close of the year 1795, Rottler proceeded on a tour through Ceylon in the capacity of Naturalist in Company with Mr.

Cleghorn,* Secretary to Lord North, first British Governor of Ceylon, who was at that time appointed by Government, to make a general tour of enquiry throughout the Island. In a letter to the Honorable Henry Dundas, afterwards Lord Melville, written in 1796, Mr. Cleghorn † thus speaks of our naturalist.

"That nothing might be wanting on my part which should add to the general stock of political or scientific knowledge concerning Ceylon, I engaged at a very moderate expense Mr. Rottler, Danish Missionary at Tranquebar, to accompany me. While he serves me as interpreter, his eminent knowledge of Botany and Mineralogy will enable me to add much curious information to sciences with which I am myself imperfectly acquainted, and I flatter myself that my conduct in this respect will meet with approbation from the ministers of a Sovereign whose reign has been so honorably distinguished by promoting useful discoveries in every quarter of the globe."

Further on in his diary Mr. Cleghorn adds under date of Jan. 7, 1796, "I met at Jaffna by appointment the Reverned Mr. Rottler, Danish Missionary at Tranquebar, whose knowledge of Botany and Natural History, will supply many deficiencies in my observations, and whose perfect acquaintance with the Malabar language will enable him to serve me as an useful and faithful interpreter." And soon after the actual commencement of their tour, he adds, "Mr. Rottler finds ample materials for Botanic researches." Rottler did not forget his own proper calling while on this tour: the following extract exhibits him in his two-fold character of missionary and naturalist; while it also shows the impression made upon Mr. Cleghorn's mind by Rottler's character as a man and a Christian.

"My most worthy friend Rottler has found many curious and undescribed plants; and the classifying and preserving them, together with his pious exhortations to such Malabar Christians as he meets with, innocently and profitably fills up the time of this truly primitive and good man."

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* For information respecting the journey, I am indebted to papers entrusted to me by my friend Dr. Hugh Cleghorn, Conservator of Forests, Mr. Cleghorn's grand-son.

† Mr. Cleghorn's MSS. diary in the possession of Dr. Cleghorn.

The results of Rottler's Botanical efforts in this journey of exploration were confided to Mr. Cleghorn, who refers to them in the following letter to Lord Melville.

OLD CAVENDISH STREET,
*4th April* 1797.

"SIR.—A trunk containing a large collection of plants from Ceylon is lying at the India House, addressed to me.

This collection was made and arranged by the Rev. Mr. Rottler, Danish Missionary at Tranquebar, an eminent Botanist, who accompanied me to Ceylon, and who remained there some time after my departure to render his assortment more complete.

It was always my intention to leàve this collection at your disposal, and I now trouble you to receive your orders concerning it, lest it should suffer by remaining longer in its present state."

Dr. Cleghorn informs me that this collection is now incorporated with the general Herbarium at King's College London.

A specimen of Rottler's method of characterizing plants in his own hand-writing, and made apparently upon this tour, is amongst my papers and may serve to show his usual habit.

"ICOSANDR ? MONOGYNIA.
an MONADELPHIA ICOSAND.

*Calyx:* Perianth. 4 fid. superum.

*Coroll:* 4 petala, petalis ovato-lanceolatis, excavatis.

*Stam: Fil.* numerosa, filiformia, ad basim parum connexa. *anth:* globosæ.

*Pistill;* Germen subglobosum. *Styl:* filiform. longitud. filamentor.

*Stig:* Simplex.

*Pericarp:* Bacca calyce coronata, globosa, polysperma.

*Semina:* Nidulantia.

*Arbor:* Foliis subalternis cuneiformib. serrat glabris.

COLOMBO, *April* 3, 96."

At the close of 1803 Rottler was nominated by his fellow Missionaries at Tranquebar to the charge of the Vepery Mission, about to be vacated by Mr. Pæzold, who had succeeded Gericke in the charge only a few months previously, on his appointment to the professorship of Tamil at the College of Fort William, Calcutta

Rottler's nomination appears to have been owing to the earnest entreaties of the native congregation of Vepery Church.* The arrangement however was brought to a close by the return of Mr. Pæzold to his former post about the month of September in the following year. Rottler's appointment had been made by the Madras Committee of the Society for Promoting Christian Knowledge, subject to the approval of their Home Committee, which was shortly afterwards obtained: Rottler likewise had accepted that appointment subject to the sanction of his original patrons, the Missionary College of Copenhagen, who, after repeated references to them, in 1807 finally declined to acquiesce in the arrangement, and directed him to return to Tranquebar.

This unexpected result had the effect of completely removing Rottler from immediate mission work for several years. For soon after his arrival at Madras he had been prevailed upon to accept the Chaplaincy and Secretaryship of the Female Asylum, which he had held for nearly four years at the time when the order for his return to Tranquebar arrived. He was willing to resign this charge; and this, together apparently with a sense of pain at the home decision, led to the relinquishment of his connexion with the Danish Mission, and as a consequence of this, with the Christian Knowledge Society also. Mr. Hough has placed this transaction in a light which is very favourable to Rottler's character. He says,† "Dr. Rottler was urged by the Governor Lord William Cavendish Bentinck, and his lady, to undertake the vacant Chaplaincy and Secretaryship of the Female Asylum, his Christian character, amiable temper, and other qualifications, pointing him out as a suitable successor to the lamented Gerické: but though the appointment was compatible with his Missionary office, and of some pecuniary value, yet he declined to accept it, until he should obtain the consent of the authorities at Copenhagen, and his permanent appointment to the Vepery Mission. The Directors hoped to remove his scruples by procuring the sanction of the Danish authorities in

* I have obtained this much desired information relating to Rottler's Madras career, from the Revd. W. Taylor's Memoirs of the last centenary of the earliest Protestant Mission at Madras.

† History of Christianity in India, iii, 469.

India : and for this purpose Sir Thomas Strange, Judge at Madras, wrote to the Governor of Tranquebar, recommending the proposed arrangement in urgent terms ; the Danish Governor immediately expressed his acquiesence in the proposal ; the Danish Missionaries also gave their consent : upon which he was induced to yield to the importunity of the Directors, and immediately sent home to the College at Copenhagen, the resignation of his appointment to their East Indian Mission."

It was during this interval of his separation from Missionary employment that Rottler projected his principal literary labour, namely, his Tamil and English Dictionary, which, notwithstanding the omissions and defects, necessarily accompanying so extensive a work, has been of infinite service, and continuing still unsuperseded as the standard Tamil Dictionary. The first division only of this work in 298 pages, and embracing the vowels alone, had been printed in the life-time of its author. But the remainder was left in an advanced state, and was completed in 1841, under the editorship of the Rev. W. Taylor.

In the year 1812, a small number of Native Roman Catholics of Royapooram made application to the Chaplain of Black Town for admission into the Protestant Church ; at his request Rottler undertook their instruction, and attended weekly at the house of one of them for that purpose. On their admission subsequently into the Church at Black Town, Rottler became their pastor, some other Native Christians from the neighbourhood forming a congregation with them. For this service, Rottler received a stipend from Government, which was continued to him when this congregation removed with him to Vepery on his resumption of the charge of that Mission. As this congregation was connected with the Church of England, it became necessary that the Church Services should be employed in ministering to them : and it was for their use that Rottler undertook at this time to translate the book of Common Prayer into the Tamil language, no such translation having hitherto existed. Respecting the merits of this work there are on record two some-what conflicting testimonies ; the College Board thought "the order of the English version too literally followed" in it : the Tamil Translator to Government on the

other hand in an official certificate states, "I think it faithfully, accurately, and clearly rendered." Notwithstanding the aid received from Government towards the publication of this translation, as well as from the two Missionary Societies of the Church at the Presidency, Rottler was for some years involved in pecuniary difficulties by it; and was finally released from responsibility on account of it so late as 1821, by the Directors of the Male Asylum consenting to discharge his debt to them for printing it, on his handing over to them the unsold copies of the work together with the amount he had realized by the sale of the remainder. The edition was one of a thousand copies, and had cost 1,581 Pagodas for Printing, and 948 Pagodas for paper. Rottler subsequently published a revised edition of a portion of this translation; an octavo edition was printed in 1828 at the suggestion and with the pecuniary aid of Bishop Heber. In 1846, Rottler's work underwent an extensive revision by a Commitee of Missionaries in Tinnevelly: and this it is, after receiving a later partial revision in 1859, which is used by the fifty thousand of Native Tamil Christians connected with the Church of England at the present day.

In 1813 Rottler was appointed by Government to the charge of the Christian congregations of Portuguese and Natives at Pulicat to visit them, chiefly for the purpose of administering the sacraments, four times in the year. He continued to pay them visits, and to receive an annual allowance from Government for so doing, up to 1817.

In the beginning of November 1817, Rottler committed the remains of his former fellow labourer Pæzold to the dust: and the Vepery Mission was by his death left without a Missionary. Rottler was requested to take temporary charge of the Mission pending a reference to the Home authorities of the Christian Knowledge Society, with the prospect of being permanently employed. His Pulicat charge was then resigned: and so, concentrating his remaining strength upon the Female Asylum and Vepery Mission, he passed the last eighteen years of his lengthened life. We need not in the pages of this Journal follow him up through the difficulties and trials which sometimes thickened around him during these latter years: it will suffice to add that he passed through them all so as to obtain the encomiums of those who knew him, and to se-

cure for himself a place in the veneration of those who remember him to this day.

Rottler was in his 69th year when he thus resumed his Missionary labors. There were at this time two separate congregations meeting in Vepery Church; the Tamil congregations, containing 233 communicants, meeting in the forenoon, and the Portuguese congregation, with its 99 communicants, meeting in the afternoon. An English Service was subsequently added to these by Rottler on Sunday afternoons, and an English lecture on Wednesday afternoons. His clerical duties at the Female Asylum, at the same time consisted of two weekly services on Tuesdays and Thursdays. Notwithstanding all we find him still vigorously pursuing his Botanical recreations, and forming a point of reference to those who were interested in similar pursuits in the Presidency.

His personal appearance about this time is thus described by an eye witness; "I first saw the good old man Dr. Rottler during his labours at black Town. He was assisting the Rev. Morgan Davis, the Minister of Black Town Chapel on a sacramental occasion. I only heard him take part in the portion of the Communion Service, which precedes the Sermon. His English pronunciation was tolerably clear and good; a little feeble and faltering through age; for his wrinkled face and silver hair announced him to be at least sixty years old. He was short in stature: his slender form was concealed by his black gown: his head was large, finely formed, and full."

The fact thus alluded to affords an instance of the Catholic spirit of Rottler; others of which might be given from his correspondence with ministers of communions different from his own which he maintained up to a late period of his life.

Rottler as we have seen had as early in 1795 arrived at the distinction of a Doctor's diploma, by his botanical acquirements: and in 1818, the Madras Literary Society sought his permission to mark his name amongst their Honorary Members, as appears from the following gratifying letter of their Secretary.

To Dr. Rottler,

Sir.— The Members of the Madras Literary Society, being desirous to manifest the sense which they entertained of your high

literary attainments, and of the advantage to be derived from your valuable assistance in the furtherance of the objects of their association, direct me to convey to you their unanimous request, that you will permit your name to be recorded in the list of the Honorary Members of the Society,

I am, Sir,
With great respect,
Your's obediently,
R. V. ANDERSON, *Act. Secty.*

MADRAS, *7th July*, 1818.

Seven years later Rottler was elected an Honorary Member of the Madras Medical Society: their Secretary communicating the fact to him in the following letters.

REVEREND SIR,

I have the honor to communicate to you, by the direction of a General Meeting of the Medical Society, held in the College Hall, on Saturday the 13th Instant, that you were proposed as a Honorary Member of the Society by Mr. Atkinson, seconded by Mr. Heyne. The vote being put by ballot was unanimously carried.

The Meeting has great satisfaction in having an opportunity of paying a mark of respect to one who is celebrated for his scientific attainments; and who with the rich sources of his information aided in the investigation of Oriental Medicine.

I am, Reverend Sir,
Your most obedient Servant,
THOS. MOORE LANE,
*Secretary Medical Society.*

MADRAS, *20th August*, 1825.

This notice may now be brought to a close: suffice it if it cause the memory of a worthy man, too soon all but forgotten, to survive through another generation in the pages of the organ of a Society which delighted to honour him while living. Our tribute of affectionate remembrance has not been too warm of one of whom Bishop Heber wrote.* "I am greatly impressed with reverence for the worthy old Missionary Dr. Rottler." We have not said more than is due of the Christian character of one whom a friend, †

* Journal iii. p. 442.

† MS. Letter from R. Clarke, Esq.

long officially and intimately connected with him, calls the "heavenly-minded Rottler;" and of whom Sir Thomas Strange remarked to Mr. Hough, that "Dr. Rottler had the simplicity of a child and was a Nathaniel without guile."* Well does one of India's most eminent Botanists sum up his character in the following words† :—"I had the happiness of knowing personally this most worthy Missionary and excellent Botanist, and of corresponding with him. Like Dr. Wm. Carey he was heart and soul devoted to the Missionary cause : he was a great Orientalist, and ardently attached to the study of plants."

Rottler's activity was continued to him up to the close of his long career : and he passed away from his work and his recreations together, at an age to which but very few Europeans have attained in India. The closing scenes are told in the following letter, (In MS.) to the Rev. R. A. Denton, Secretary M. D. C. S. P. C. K.

Rev. and Dear Sir,

I have the painful duty to forward to you a short account of the last illness and death of your Society's aged and venerable Missionary Dr. Rottler. On Wednesday morning Jan. 20, he was seized with paralysis, which terminated in his removal to his heavenly rest on the following Sunday morning. On the day that he was seized I went to see him and found him not able to speak distinctly, his eyes were closed, one side of his face distorted, and without feeling on one side of his body : when I spoke to him he knew me. On Thursday morning I went again to see him and found him somewhat easier ; his face had returned to its natural form. On Friday morning he appeared much weaker and worse, and from this time continued rapidly to sink. On Saturday morning he was much worse, I mean nearer his end, his breathing more difficult. In the evening he had upon him a sweat that showed his death to be at hand. I left him at ten, thinking he might possibly live through the night, but I was called up on Sunday morning about half-past two, and informed that he had just expired. Throughout his whole illness he was evidently at peace both as to body

* Christianity in India, iii. p. 471.

† MS. Letter from Mr. Wallich, to Dr. Cleghorn.

and mind, and at the last without a struggle or sigh fell asleep in Jesus.

Only the Sunday preceding his illness he was at Church twice, in the morning at the Tamil, and in the evening at the English Service. On Monday evening he was at my house at our usual weekly Meeting of the Catechists : he sat with us longer than usual and seemed remarkably cheerful and well. The night before he was seized with paralysis he expounded as was his custom to the young people in his house, but was much longer and more animated. And on the morning before he was taken ill he had a young native girl, his adopted daughter's ayah, to read some portion of the Tamil Testament to him, and to have it explained to her. Up to the day preceding his illness he was engaged on his Tamil and English Dictionary. His age was 86 years and 7 months. His venerable remains attended by the Archdeacon and Clergy of Madras, and a great number of Europeans, East Indians and Natives, were interred in the Vepery Mission Church-yard on Sunday evening. He has left all his books, manuscripts, herbarium, &c. to the Vepery Mission, and a small house at the death to one of his servants who now occupies it. If the Committee would allow a small simple tablet to be put up in Vepery Church over the place in which he always sat, I am persuaded that Europeans, East Indians, and Natives would gladly unite in subscribing to raise one.

I am, Rev. and Dear Sir,
Truly and obediently your's,
C. CALTHROP,
VEPERY, *Feb.* 2, 1836. *Missy. S. P. G. F. P.*

The herbarium so bequeathed to the Mission was subsequently presented by the Society to King's College London, where, as we have seen, it remains, and is conspicuously labelled "Dr. Rottler's Herbarium." The botanical portion of his books were a few years ago presented by the Gospel Propagation Society to the Madras Medical College, where most of them still remain. Amongst them is an interesting MS. Catalogue of Indian, &c. plants in Rottler's handwriting, which, from the figured references attached to each species, seems to have been the original Catalogue of his herba-

The suggestion made at the close of the preceding letter was fully carried out, and an "affecting tablet," as Wallich calls it, was erected to Rottler's memory in Vepery Church, and several Rottler's scholarships were founded in the Seminary attached to it. The Society with which he was connected have recorded a lengthened minute upon Dr. Rottler's death, in which, after recounting the principal features of his Missionary career, they pay the following pleasing tribute to his memory.

"In his public and private character no one could be more deservedly beloved and respected : for many years he persevered in his holy calling when heavily afflicted with sickness : for the first ten years of his life in India, he was a constant sufferer, seeking his recreation in the most becoming and innocent fields ; and in the end he was brought to his heavenly rest in peace. A worthy associate of Swartz and Guiché, the last but one or two of those holy and apostolic men who were the privileged few in earlier years that had committed to them amongst the heathen in this land of darkness, the ministry of reconciliation."

The tablet in Vepery Church is by Westmacott, and bears the following inscription,

"Sacred to the memory of the Reverend John Peter Rottler, P. D., Missionary, who fell asleep in Jesus on Sunday morning, January 24th, 1836, aged eighty-six years, and seven months.

This venerable servant of God having for the cause of Christ left his country, kindred and father's house, in Germany, labored as a devoted Missionary in India for above sixty years, formerly in the service of the Royal Danish Mission at Tranquebar, and latterly, at Vepery, in the service of the Society for Promoting Christian Knowledge. He was also for several years Chaplain to the Madras Female Orphan Asylum.

As a testimony of reverence for the memory of this excellent man and as an acknowledgment of the mercy, faithfulness, and grace of God exhibited in his life, labors, and death, this tablet is erected by the united subscription of European, East Indian, and Native Christians.

'Be not slothful, but followers of them who through faith and patience inherit the promises.'

'The harvest truly is plenteous, but the laborers are few : pray ye therefore the Lord of the harvest that he will send forth laborers into his harvest.'

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## 11.—*Report on the Bustar Zemindary: by Capt.* CHARLES ELLIOT, C. B., *Madras Artillery, Deputy Commissioner of the Chuttees-gurh or Raipore District, in the Province of Nagpore.*

No. 51.

FROM

CHARLES ELLIOT, ESQ.
*Deputy Commissioner, Raipore.*

To

G. A. C. PLOWDEN, ESQ.
*Commissioner of Nagpore.*
*Dated Camp Joonagurh, 27th May* 1856.

SIR,

I have the honor to forward my Proceedings in the affairs of the Rajah of Bustar together with such authentic and well established information regarding the dependency as I have been enabled to gather during my recent tour.

Boundaries. 2. The large dependency of Bustar situated to the south east of the Chutteesgurh District may be said to be comprised between 17° 40 and 20° 20" parallels of north latitude and 80° and 82° 40" degrees of east longitude, and is bounded on the north, by Kakeir, the Dhumterry Tahsildary of Chuttesgurh and the Bendry Nowagurgh Zemindary attached to Sumbulpore; on the east by the Jeypore dependency attached to the Northern Circars; on the south by the Godavery river; and on the west by Wyragurh in the Chandah district. Its extreme length from north to south may be stated at about sixty-seven (67) Coss (gondee) or 235 miles, and its breadth from east to west at about fifty-two (52) Coss or 182 miles.

Divisions. 3. Some discrepancies exist in the papers produced by the Rajah, which renders it difficult to arrive at a satisfactory conclusion regarding the original and present divisions of the country, so as to reconcile the one with the other; the following however may be relied on as an approach to accuracy. The dependency formerly consisted of 57 Khalsa sub-divisions (48

Ghurs and 9 Talooks) and 13 Zemindaries; in all 70 sub-divisions. Of these, seven Ghurs* are now included in the Jeypore dependency, five of them having been ceded by Duryao Deo, the 14th Rajah, about 80 years ago, in lieu of assistance received from the Jeypore Rajah, to enable him to recover the throne of the dependency from his younger brother Ajmeer Sing, who had forcibly wrested it from him; the other two Ghurs or Talooks (Nos. 6 and 7) are stated to have been encroached upon by the Jeypore Rajah, the former in the time of Dulput Deo, Rajah of Bustar, and the latter in the time of Mahipal Deo his son. Three Gurhs (Shawah, Singpore and Muckka) forming the Talook of Shawah, were in the year 1240 Fusly, transferred to the Nagpore Government, together with the whole of the Sayer collections of the dependency (Khalsa portion) in lieu of the Takolee formerly paid, and amounting to Nagpore Rupees 4,000, which it was found difficult to collect. Five villages held as Mokhassa by the widow of Mahipal Deo, were retained. One Gurh named Bhutgurh has passed over to the Bendry Nowagurh Zemindary and another, Deo Dougurh, to Kakeir, at what time is not known. Seven Ghurs as per margin have been given in Mokhassa to Zemindars, of which Lingagiri was incorporated by Mahipal Deo in the Zemindary of Bhopalputnam, on account of the assistance received from that Zemindar in apprehending one Dhurma Rao, for which orders had been received from the Nagpore Government. Three (3) Gurhs in Dhuntewarra, Pratapagiri, Kuttikalion and a part of Jaitgiri have been alienated to the goddess, Dunteshwaree. The Gurh of Barsoor was in the time of Duryao Deo divided into two named Barsoor and Chindnar. Of the 13 Zemindaries, 4 on the northern side of the Godavery, have passed over to Hydrabad, those of Cherlah, Loongroo and Rekpully in the time of Duryao Deo and Albaka in Mahipal Deo's time. There now remain therefore 36

| | Ghurs. | Zemindars of what Talooks. |
|---|---|---|
| 1 | Sonepore........ | Purlkote. |
| 2 | Mungenar.... | Bhopalputnam. |
| 3 | Lingagiri..... | Bhopalputnam. |
| 4 | Bhyrungurh .... | Tootroo. |
| 5 | Irole Buchole.... | Chittlenar. |
| 6 | Ameergurh... | Sookmah. |
| 7 | Chingurh..... | Sookmah. |

*1. Koteepur.
2. Choorchoonda.
3. Omercote.
4. Raigurh.
5. Poragurh.
6. Bagdurh.
7. Salmee.

sub-divisions (27* Gurhs and 9† Talooks included Jugdulpore within the limits of which are several villages forming separate charges) ‡ 9 Zemindaries besides the five villages of Shawah formerly mentioned.

| No. | * Gurhs. | Abad Villages |
|---|---|---|
| 1 | Dongur.......... | 135 |
| 2 | Narrainpore...... | 81 |
| 3 | Kolur .......... | 37 |
| 4 | Shampore........ | 41 |
| 5 | Amramultee...... | 12 |
| 6 | Pratatiapore...... | 73 |
| 7 | Amabeda........ | 18 |
| 8 | Antagurh........ | 22 |
| 9 | Chota Dongur..... | 36 |
| 10 | Bumnigurh...... | 8 |
| 11 | Saliarah......... | 8 |
| 12 | Jaitgiri.......... | 17 |
| 13 | Mudhota........ | 17 |
| 14 | Koomaconda..... | 30 |
| 15 | Barsoor......... | 15 |
| 16 | Chindenar....... | 3 |
| 17 | Tirthagurh...... | 19 |
| 18 | Kykagurh....... | 2 |
| 19 | Murdapar ....... | 20 |
| 20 | Chendergiri...... | 1 |
| 21 | Bhanpore........ | 0 |
| 22 | Murpar......... | 6 |
| 23 | Makree......... | 10 |
| 24 | Chitterkote...... | 15 |
| 25 | Eirpond........ | 5 |
| 26 | Kurrikotee...... | 4 |
| 27 | Bejeypore.. ..... | 84 |

| No. | ‡ Zemindaries. | Villages |
|---|---|---|
| 1 | Bhopalpatnum ... | Number not known. |
| 2 | Kootroo......... | |
| 3 | Phothekeil........ | |
| 4 | Kotapal........ | |
| 5 | Pameit........ | |
| 6 | Bhejee........ | |
| 7 | Chittelnar........ | |
| 8 | Sookma........ | |
| 9 | Purlkote........ | |

| | No. | † Talooks. | Villages. |
|---|---|---|---|
| Jugdulpore. | 1 | Agrawarah........ | 73 |
| | 2 | Raikerah........ | 51 |
| | 3 | Amorah........ | 17 |
| | 4 | Kesurpal........ | 36 |
| | 5 | Sonabal........ | 47 |
| | 6 | Amabal........ | 28 |
| | 7 | Kulihorah........ | 31 |
| | 8 | Gudia........ | 27 |
| | 9 | Paterwerah........ | 8 |
| Within the limits of Jugdulpore. | 1 | Judulpore with Paraho | 1 |
| | 2 | Baragoom........ | 12 |
| | 3 | Punchgaon........ | 4 |
| | 4 | Madian........ | 11 |
| | 5 | Miscellaneous........ | 8 |

General description. 4. In Sir Richard Jenkins' Report on the Nagpore Porvince, Bustar is described from hearsay and general report as a "woody and a hilly tract, the villages of which alone are cultivated and partially cleared of jungle" and although the country has been more than once visited by Native officials of inferior grades, yet this character has up to the present time been carefully preserved, and no effort has hitherto been made by the parent state to ascertain or control in any way the management of this portion of the country, or to elicit and interfere or take an interest in its condition and prospects. It is not therefore to be

wondered at, that its progress both morally and physically, as considered in relation to the amount and character of its cultivation, has been even more retarded than the district to which it is attached, whose peculiarities as compared with the other parts of the Province have already been noticed. I entered the Bustar dependency after my tour in Kakeir by the Shawah Talook, and proceeding south east towards Jugdulpore traversed the centre of the entire Khalsa portion, as far as Duntewarah where it ends, all to the south of that being Zemindary. I was enabled therefore to form I believe a pretty accurate idea of the general appearance and condition of the dependency, independent of information received on enquiry from others. Nothing could be more at variance with the account rendered to Sir R. Jenkins, and the universally circulated opinion even at this day. The general surface of the country is undulating, inclining to plain (as shown by the sluggishness of the streams) except where broken by an occasional range of hills, which is seldom and at distant intervals, but where occurring mostly of considerable height and abrupt volcanic formation. The soil is, with apparently little variation a rich alluvial bed of some depth overlying a stratum of clay slate, and is of a light, friable and exceedingly fertile nature, as shewn when cleared of jungle by the bearing of nearly all crops without distinctions and without any attention to the supply of water. The natural wood covering the face of the country also bears a great similarity throughout, principally consisting of the "Serai" which I imagine to be the "Sal" or Shorea robusta, which grows in large quantities over a great extent of country. It is easily felled however, and the ground cleared by the process mentioned in para 5 of my letter as per margin, called "Dabee", which consists in burning the wood on the ground, attaining the double purpose of clearing and fertilizing. Notwithstanding all these facilities the amount of cultivation does not bear the proportion of one to fifteen of surface, though it would be difficult to point out any country possessing more natural advantages.

No. 36 dated 4th April 1856.

Towns.

5. The former capital of Bustar was a town of the same name, situated about 4 coss to the north of the town Jugdulpore, where the Rajah at present resides

It is now deserted, having been abandoned in the days of Duryao Deo on account of its unhealthiness, although it bears the marks of having been at one time a very extensive town, the limits of which may now be traced to a circuit of about 2 coss or about 7 miles. Jugdulpore, now the principal town, is situated on the banks of the Indrawutty at a distance S. S. E. from Raipore of about 200 miles. It contains about 400 houses of inferior construction, thatched with grass, the walls being formed of bamboo matting plastered with mud. Such being the condition of the town chosen as the residence of the Rajah, it is not surprising to find that the names of no more than 30 or 40 villages are mentioned as containing from 100 to 200 houses all of the same construction. The names of some of these have been inserted in the margin. An extraordinary custom prevailed in this dependency until within the last 2 or 3 years when it was put a stop to by the present Dewan Dulgunjun Sing which would fully account for the inferior class of houses. Whenever any member of a household died it was considered necessary to destroy the whole of the tenement in which the event took place, and to build another on some other spot. Nothing, it may easily be conceived, could more effectually tend to retard and keep the people in a constant state of restlessness.

| Villages. | No. of houses about. |
|---|---|
| Dongur........ | 250 |
| Bejeypore ........ | 200 |
| Marhar.......... | 200 |
| Bajamurh........ | 200 |
| Kondagaon ...... | 200 |
| Sampore ........ | 150 |
| Narrainpore...... | 150 |
| Rajoor........ | 150 |
| Kakloor.......... | 150 |
| Metapal ........ | 150 |
| Moolmoola ...... | 150 |
| Killapal ........ | 150 |
| Pratabpore.. .... | 100 |
| Barsoor .......... | 100 |
| Koomakonda ..... | 100 |
| Kustoori .. ..... | 100 |
| Kurpawurh. .... | 100 |
| Malakotee........ | 100 |
| Rajunggurh .... | 100 |
| Nuggurnar....... | 100 |

Rivers.

6. The principal river in the dependency is the Indrawutty which rising in the ghauts of Thooamool to the north east of the dependency, pursues a south westerly course through the centre of the country, receiving many tributary streams, and forming with them, which include nearly all those worthy of mention, the natural watershed of this division of the Province. The river is not of great breadth but its bed is rocky, and its stream is constant throughout the year. Its extreme length from the source to where it joins the

Godavery near Bhopalputnam is about 300 miles. Its principal tributary the Kotree which rises in Kakeir and flows south through the Pratabipore Gurh on the west is broader and apparently also a river of some importance. The Sunkaree and Dunkaree also rising in the Hills south of Duntewarrah, which is situated about the centre of Bustar, unite behind the temple of Duntaíshwaree, and taking a course about west by north, join the Indrawutty near the village of Nelloogooda in the Kotroo Zemindary about 21 miles west of Duntewarrah. The Kholop has its origin in the Jeypore dependency of the Northern Circars, on the east of Bustar and flowing south through the Sookma Zemindary, forming the frontier line on the south-east, falls into the Godavery. There are besides these many other streams, but so inconsiderable as not to require a separate mention, a list of the principal ones has been inserted in the margin.

| | |
|---|---|
| Barda | River. |
| Bhowerdig | ,, |
| Narungee | ,, |
| Boreah | ,, |
| Bhaskala | ,, |
| Goreah Bahar | ,, |
| Nowagaon | ,, |
| Joriwang | ,, |

Hills. 7. Two separate ranges of Hills traverse the Bustar dependency, one branching off in a spur from the eastern ghats in the Jeypore dependency, runs south west terminating in the Sookma Zemindary of Bustar, about 50 miles south from Jugdulpore; the other range enters the dependency from Chandah and crossing the Indrawutty runs due south east through the Bhopalputnam Zemindary of Bustar, and south of the Dunkaree river, until it reaches the Godavery; the former of these is locally known as the "Toolser Dongree" and the latter as the "Beila Durda Hills," which as seen from a distance appears to be a very considerable range. Besides these a large range is described as traversing the Narrainpore Talook from east to west, to the north of the Indrawutty. It is said that on the Beila Durda Hills a race of wild people live who have no intercourse with the people of the plains; they are generally naked, the women wearing aprons of leaves in front. They run away on the approach of any one not belonging to themselves, and pay no tribute in cash to the Rajah. They pay however in kind of the produce of their villages; this is collected once a year by a peon who beats a tom tom outside the village and after he has hidden himself the people

bring out whatever they have to give and deposit it on an appointed spot. They live on roots, grain raised in the Jungles, and fruits, and are called *Madians.* I met with no one who had seen them and I found the locality called Ulijmand was so far to the south as to prevent my proceeding there myself during the limited time at my disposal.

Population, Castes and Languages.

8. From the absence of accounts, and the extent and condition of the dependency, the irregularity of the villages, and the prevalence of the wild tribes whose numbers can be only roughly estimated it has been found impossible to arrive at any accurate result regarding the number of the population but it is stated by those best acquainted and most capable of judging, at about 80,000 of both sexes and of all castes and ages. The bulk of the inhabitants are of the Gond caste and consist of two subdivisions or tribes called Moriahs and Mariahs or Joriahs ; after them the most numerous castes in order of their strength and importance are :

1. Buttras.
2. Gandahs.
3. Soondees } Equal.
4. Marahs. } Equal.
5. Hulmahs.
6. Morars.

The Moriahs are distributed over the north of the dependency and the vicinity of Jugdulpore and the Mariahs to the south and west of it. The Moriahs both in their manners and occupation are in a more advanced state than the others, inhabit the more settled parts of the dependency, dress and live better and form the mass of the cultivating population. They have no minor distinctions of occupation amongst themselves as barbers, washermen, &c., but each makes his own arrangements in these respects and the only or rather most common ( for some villages have not even all these ) village servants are the Majee or Potail, the Poojaree and the Ganda or Kotwal who also weaves cloths for the village. The dress of the Moriahs consists simply of a waist cloth of coarse village manufacture and very rarely a turban. They ornament themselves with necklaces and earrings and generally carry a small axe (tangia) for chopping wood, about 8 or 10

inches long and very narrow in the blade, and a knife in the waist cloth small and of varying form. The language of the Moriahs is a mixture of several, the principal of which appear to be the Hindu, Telugu, Canarese and Mahratta. They eat indiscriminately all kinds of grain and the flesh of most animals excepting the buffaloe, fox, dog, cat and snakes, though only within their own caste. The men are robust, strong and active, generally intelligent, well disposed, and bear the character of being very trustworthy under proper management; they would appear to be susceptible of great improvement. Their mode of arranging and celebrating the marriage ceremony, is worth relating, as it is universally followed by all. The betrothal and propriety of the marriage of any two members of the caste is referred to two of the elder and more respectable men of the village (one being chosen by each party) who having met by appointment, fill an earthen vessel with water and each gently drops a grain of rice one in the name of the boy and one in the name of the girl at opposite sides of the vessel, which are watched with much interest, the success of the suit being dependent on the meeting of the two grains, in which case the proposal is looked upon as propitious, is accepted and arranged accordingly. Afterwards on an appointed day, the bride and bridegroom are anointed with saffron and oil, their garments tied together and their foreheads marked; the friends on both sides then eat and drink together. The dieties chiefly worshipped by the Moriahs in common with the Mariahs are three in number namely :—

1st. Bhoo Devi or The Earth.
2nd. Dongar Deo or The Hills.
3rd. Bhimpen.

of the two first no representation is made, but a small hut (mundar) is erected as the house of the god or goddess, where the people offer fermented liquor, drinking the remainder themselves. The third appears to be the peculiar deity of the people of Bustar and is called indiscriminately Bhimpin, Bhima or Bhim Deo; the representation of it (apparently signifying a God and a Goddess) being made by the insertion in the ground of two pieces of wood 3 to 4 feet in length, one a little shorter than the other. The worship of this

God is regularly performed once a year previous to using the new grain of the season, at other times each brings his offering and presents it to the God. Besides these, every village throughout Bustar contains its representative of Duntaishwarree, called Maolee, and also the common village Goddess of the small pox, or Sitla Maee, here also erroneously denominated Bhowany and Thakorin. The Mariahs or Jhorias are the same, their name being derived from words in use among them signifying trees and jungle, significant of the locality which they inhabit. Their dress is of the most scanty nature, barely serving the purposes of decency, and their women especially wearing no more than an apron of leaves without any covering above. Their language is said to differ from that of the Moriahs; my circuit did not lead me through any part of the country inhabited by them, but they are described (by those on whose word I believe I can depend) as being a large and powerful race, mixing but little with the other tribes, sensitive though well disposed and bearing a singularly high character for honesty and trustworthiness. Their women engage in out of door labor in conveying the baggage of travellers and in carrying loads. They are even less discriminate in the choice of food than the Moriahs and do not reside long in one village, but change the site every 3 or 4 years. Their villages are formed in one long street by two rows of houses one opposite the other. Besides the two foregoing the following castes are enumerated as inhabiting the more civilized portions of Bustar.

| | | | |
|---|---|---|---|
| 1. | Bhuttras. | 9. | Kamit. |
| 2. | Gandas. | 10. | Telee. |
| 3. | Soondees. | 11. | Koombar. |
| 4. | Mahras. | 12. | Nao. |
| 5. | Hulmas. | 13. | Dhobee. |
| 6. | Moraes. | 14. | Chumbar. |
| 7. | Purja or Jugra. | 15. | Ghussia. |
| 8. | Gudmas. | 16. | Kosta. |

The 1st of these, though strictly speaking Gonds, assume to themselves the pretensions of a superior caste in many instances, wearing the brahminical thread, and are frequently entrusted with

the service of the village temples. They also are cultivators. It may here be mentioned that until within the last 4 or 5 years the practice of selling the privilege of wearing the brahminical thread was followed by the Rajah towards the following castes Dhakurs, Bhuttras, and Soondees. It is now said to be discontinued but as the privilege is hereditary, there are at present great numbers of wearers.

The 2nd are a numerous class subsisting by the weaving of cloths.

The 3rd correspond to the Kullals or distillers of spirituous liquors which are largely consumed.

The 4th consist of two subdivisions called Andoocoory and Mirgaon, both are weavers of cloths.

The 5th are a pretty numerous, ancient and somewhat important class. They as well as the Bhuttras have been allowed to assume the brahminical thread together with one or two other special Hindoo customs, as the application of sandal caste marks, and they would appear to have been originally Gonds who have subsequently adopted customs peculiar to the Hindoos. Their language also differs from other existing dialects, and is generally spoken by Moriahs and others.

The 6th or gardeners are also pretty numerous. Of the rest none are deserving of mention on account of their numbers.

The 7th are cultivators and serve also as bearers.

The 8th are only found in one village near Jugdulpore; their numbers are small, not exceeding 50 houses. They are cultivators but weave their own cloths; and no girl is considered marriageable until she can do so. The women wrap a coarse cloth round their waists which is retained in its place by a cord, and tie also a cord round their necks which hangs down in front concealing the breasts. A few Ooriyah brahmins and Mussulmen have also settled in the country; the former hold villages. The latter are but few.

9. The productions of this dependency are very various and from the natural advantages of soil and climate of almost unlimited diversity: the mode of preparing the soil and the implements used, do not differ from those in use generally in other parts of the Province. The mode of cultivation called "Dabee" also practiced here has already been described in para. 5, of letter No. 36, dated the 4th April 1856. The principal products are :—

Productions.

WEIGHTS AND MEASURES IN USE IN BUSTAR.

*Dry Measure.*

| | | | |
|---|---|---|---|
| 40 | Rs. weight | = | 1 Solee. |
| 4 | Solees | = | 1 Pyhlee. |
| 2 | Pyhlees | = | 1 Vodee. |
| 20 | Vodees | = | 1 Candee. |

*Liquid Measure.*

| | | | |
|---|---|---|---|
| 20 | Rs. weight | = | 1 Seer. |
| 8 | Seers | = | 1 Pyhlee. |

*Goldsmith's Weight.*

| | | | |
|---|---|---|---|
| 4 | Gunjas (red seeds) | = | 1 Mas. |
| 12 | Mas. | = | 1 Tal. |

*Money Table.*

| | | | |
|---|---|---|---|
| 20 | Cowries | = | 1 Boree. |
| 12 | Bories | = | 1 Dooganee. |
| 10 | Dooganies | = | 1 Kutcha Rupee. |
| 20 | Do. | = | 1 Nagpore Rupee. |
| 22 | Do. | = | 1 Compy.'s Rupee. |

| | |
|---|---|
| 1 | Rice. |
| 2 | Grains and Pulses. |
| 3 | Mundia. |
| 4 | Kodo. |
| 5 | Khootkee. |
| 6 | Oil Seed, Castor and Til. |
| 7 | Cotton. |
| 8 | Sugar Cane. |
| 9 | Honey and Wax. |
| 10 | Tikur. |
| 11 | Bechandee. |
| 12 | Lakh. |
| 13 | Dhoop. |
| 14 | Mohva. |
| 15 | Sendree (a red dye.) |

It would be difficult to give any idea of the proportions of these nor do they require any particular mention. The lakh produced in the Bhopalputnam differs from that of other parts in being produced on grass and the palas tree, the 1st of which is said to be of superior quality. The tree on which lakh is generally found and propogated is called the Koosoomb. Teakwood is said to be plentiful in the Zemindaries of Bhopalputnam, Katapaul, pawiet, Photikail, Bhejo and Chittlenar. The forest in the Khalsa portion of the dependency consists almost wholly of "Serai" and "Tendoo."

10. The whole Revenue of Bustar as shewn in the accounts produced (which are very defective and incomplete) is stated at Rupees 25,870-14-0 for every branch, the details of which are as follows :—

Accounts.

| | | | | |
|---|---|---|---|---|
| Land Revenue........ .... ...... | 9,040 | 14 | 0 | Particulars of these are shewn in the annexed Statement No. 2. |
| Mokhassah........ .............. | 1,416 | 0 | 0 | |
| Zemindaree...................... | 3,200 | 0 | 0 | |
| Pandree........ ..... ......... | 214 | 0 | 0 | |
| Sewai...... ........ ........... | 12,000 | 0 | 0 | |
| Total Rupees... | 25,870 | 14 | 0 | |

The Expenses being stated as follows :—

| | | | | |
|---|---|---|---|---|
| Mokhassa, &c.................. | 3,760 | 0 | 0 | Particulars of these are shewn in the annexed Statement No. 3. |
| Expenses of Management. ........ | 1,307 | 0 | 0 | |
| Sudder Establishment...... ...... | 7,883 | 8 | 0 | |
| Private Expenses.... ........... | 25,130 | 8 | 0 | |
| Total Rupees.. | 38,081 | 0 | 0 | |

being one-half more than the receipts. It may not be unreasonable therefore to assume that the accounts that have been produced are incorrect, either from negligence or intention, perhaps partly from both. The Rajah (as will hereafter be noticed) being only 18 years of age, and incapable of undertaking the management of the country, that office has devolved on his uncle Dulgunjun Sing who hitherto, whether from unfitness or from want of the requisite information and guidance, has not succeeded in establishing any system of administration by which alone the affairs of so extensive a dependency can be worked with an advantageous result. The Talooks are managed by means of a Talookdar having under him a karkoon and five or six peons, all however under paid, the first not receiving more than from Rupees 4 to 5, and the accounts rendered by them very incomplete. It appears probable

therefore that some part of the collections are appropriated here, as no "chowkassy," or periodical enquiry into the state of the villages, is made by any public Officer belonging to the Sudder establishment. At all events it is palpably impossible that so great a discrepancy can exist between the receipts and expenditure, or the list of debts would be overwhelmingly great, which is not the case, the complaints on this account which have been received not exceeding in all Rupees 15,000. The land tax is levied as in Chutteesgurh on the plough and varies from 8 Annas to 1 Rupee. In many parts of the country, the plough is not used, and the soil is cultivated especially where hilly, by an instrument called "korkee" resembling a hoe, on which a tax is levied of from 4 to 8 Annas. From the amount of Sewai however, even supposing the statement to be correct, the land assessment would seem to be thus highly fixed on account of the liability to increased levies under this head in fines and other impositions on various branches of moral conduct. It will also be observed that the disbursements on account of management bear a very small proportion to the whole amount stated to be expended. In the Sayer, which together with the Talook of Shawah, has since the year 1240 Fusly been in the hands of the Government in lieu of the Takolee formerly paid, is included the *kallalee* or collections on account of Abkaree, and so much of the *pandree* of the dependency as is levied on the looms of the weavers (Gandas). This has been given on contract annually for Nagpore Rupees 5,000, and the Talook of Shawah yielding about Nagpore Rupees 1,000 more. A few simple and fundamental rules of management have been furnished to Dulgunjun Sing, together with forms of accounts and suggestions on the distribution, strength and pay of what it would appear to me his administrative establishment should consist. He appeared anxious to receive them, expressed his wish to abide by them and alleged that no representative of the Government having previously visited or taken an interest in the affairs of the dependency, he had not before had any opportunity of acquiring a knowledge of how to conduct his duties as Dewan on the part of the Rajah. This is very true ; and I think it but just, as he is the natural guardian and trustee while the Rajah remains incapable of assuming charge of his own affairs, that the faith of his protestations

should be tested, which can be done in the course of a season or less, and his removal, should such become necessary, be more formally and satisfactorily proceeded with.

History.

11. The Rajah of Bustar is said to be descended from Pandoo, in whose line there was born at Delhi a Rajah named Veerbudr, who being much favored by the Goddess in that city named Deleswaree, she conferred on him a weapon of war after which he, accompanied by the Goddess under the name of Bhowanishwaree, went to Muthoora and reigned there, the Goddess here also presented him with a spear (soola). After some generations a Rajah named Veerkesree left Muthoora for the purpose of invasion and taking with him his weapons and accompanied by the Goddess under the name of Manikeshwaree established himself at Warungul in Hydrabad. The Goddess here bestowed upon him a spear (Sang) and is now worshipped at Jugdulpore. After some generations there was here born a Rajah named Pratab Roodr, who is said to have had three eyes and to have been an incarnation of Maha Deo. It is related that during his time golden rain fell. He was succeeded by his brother Amunn Deo who was driven from Worungul by the king of Delhi, and took refuge in Bustar accompanied by the Goddess who here assumed the named of Dunteswaree and presented the Rajah with a sword (kudga) now worshipped in the Rajah's house. For 17 generations (the number of years is not mentioned,) the family have continued to rule in Bustar. They are said to be Rajpoots of the family of the moon, and bear the title of Ruthputty, the Rajah sitting on the Ruth annually at the festival of the *Dussera. The present Rajah Bhyro Deo succeeded his father Bhopal Deo in 1262 Fusly, and is now about 18 years of age. He appears quiet and well disposed but not intelligent and his education has not been conducted in a manner befitting the expectations of his position or commensurate with the requirements of one born to so extensive and important a charge. In short he appears to have been wholly neglected and though I have heard it alleged that he is deficient in intellect, yet I think his Peculiarities are more to be attributed to want of opportunities and proper training and to the fact of his

* On this occasion he wears the Jewels of the Goddess Dunteswaree which are sent from Dunteswaree for the purpose.

never having travelled out of Jugdulpore. It is much to be deplored that the expenses on account of retinue, presents, &c., generally confine these petty rulers within their own limits, thereby depriving them of all the benefits attendant on travelling ; and opportunities of observing the progress of other states, however close at hand, are entirely lost. It is most desirable that this should be corrected, and having once fully explained the method laid down by Government for observance in receiving and returning visits : I am hopeful that future communication and intercourse will be much facilitated.

History and Character of Dulgunjun Sing the present Divan.

12. The following information regarding recent events in Bustar may be thought not altogether unimportant. It has been made out after comparing the Statements of several persons well acquainted with the facts and the papers in the Government records relating thereto and as being closely connected with the proceedings of Dulgunjun Sing Lall will serve as a sort of introduction to the consideration of the propriety of retaining him in the management, prepare the way for the chances of his acquitting himself satisfactorily of the trial which I think it is but fair to give him, and proving himself as capable under proper direction of shewing as much energy in following out the directions now afforded him as he has hitherto shewn in pursuing apparently the bias of his own inclinations, or of failing altogether, in either of which cases the course to be pursued seems clear. Mahepal Deo died in or about the year 1248 Fusly and was succeeded by his son Bhopal Deo (father of the present Rajah Bhyro Deo) whose younger brother Dulgunjun Sing remained under his protection. About the year 1251 Fusly the Rajah of Nagpore having sommoned Bhopal Deo to attend to give answer in some enquiry regarding Meria matters, and being unable on account of sickness (some affection of the eyes) to proceed in person, he sent Dulgunjun Sing his brother then about 16 years of age in charge of his Dewan named Jughkundoo. A copy of the agreement then entered into and signed by them is attached. They remained about 6 months in Nagpore, and from his intelligence and readiness Dulgunjun Sing made so favorable an impression on the Rajah and the then Resident Major Wilkinson, that

they wrote to the Rajah of Bustar recommending him to appoint Dulgunjun Sing to the management of the dependency with the title of Diwan. Bhopal Deo was much pleased with the result of this visit to Nagpore and employed his brother as had been directed by the Rajah and Major Wilkinson. In 1255 Fusly an agreement was entered into between the two brothers, by which Dulgunjun Sing was vested with the management of the dependency, and empowered to dismiss and entertain the servants that might be employed or required therein, the Rajah reserving to himself the right of granting lands, villages or talooks or any mark of respect, and of directing the course of procedure in all criminal matters, which were to be reported for his orders. With this Dulgunjun Sing received 18 Gurhs as an appanage for his livelihood. It appears however, that he managed to make himself so powerful as seriously to inconvenience and alarm the Rajah who in 1257 Fusly, about one year subsequent to the arrangement, wrote an urzee to the Soobah at Raipore representing the overbearing conduct of his brother, &c. on which the Soobah, knowing the brothers to be on unfriendly terms, sent for Dulgunjun Sing and detained him about 6 months in Raipore, after which the case not having been proved against him, he paid a visit to the Rajah at Nagpore and returned to Bustar with an escort of Sowars and an order granted him by the Rajah directing Bhopal Deo to reinstate him and not to injure him in any way. This result is said to have been produced by Dulgunjun Sing having explained the cause of the discussion between himself and his brother to have arisen, through family quarrels fomented by designing servants as well as to the failure at Raipore of the charges brought against him by the Rajah his brother. It does not appear however, that even yet an amicable understanding had arisen between the brothers as about three years afterwards Dulgunjun Sing separated himself from the Rajah with the intention of taking refuge in Jeypore, and proceeded as far as Tarapore the first stage from Jugdulpore. Hearing the intelligence the Rajah despatched his two principal and trustworthy public servants, named Juggernath Bheidar and Jughbund to detain his brother, but Dulgunjun Sing having in the meantime gained over the people, these two persons were apprehended by them and brought into Tarapore where they are said to

have been fettered and buried in the ground up to the neck. On their release the two persons made a formal complaint to the Rajah, who summoned Dulgunjun Sing to Nagpore to answer for it, but as he paid no attention to the order, it was found necessary to send a force to apprehend him. On his arrival at Raipore in 1261 Fusly he was imprisoned for a period of 18 months, and was then taken to Nagpore. Bhopal Deo his brother, the Rajah of Bustar, died in 1262 Fusly, and a petition was presented by a Vakeel at Nagpore in the name of Bhyro Deo, the son of Bhopal Deo stating that his father had died, that there was no one capable of undertaking the management of the estate, and praying therefore that his uncle might be released, &c. The Rajah however, suspecting the authenticity of this, deputed one of the public servants at Raipore (a Kotwal receiving 7 Rupees per month) to ascertain the state of matters at Jugdulpore. The object of this person's mission seems to have been to patch up the quarrel, and to arrange the return of Dulgunjun Sing once more to conduct the affairs of the dependency. He obtained from the Rajah a petition to the same effect as that formerly received, and deposed before the Rajah of Nagpore to its being the earnest desire of Bhyro Deo and his mother that Dulgunjun Sing should once more be released and allowed to return to the management of affairs. This the Rajah approved, and at the same time issued an order to the Soobah at Raipore, enclosing copies of an agreement (Karar) taken from Dulgunjun Sing and a list of 18 gurhs composing his appanage, from information obtained from himself, (which however entirely differ from those originally allotted to him having been it is supposed selected). The agreement is to the effect that the Rajah is the rightful ruler and that Dulgunjun Sing should not go beyond the limits of his 18 Gurhs. Dulgunjun Sing returned to Bustar for the third time in 1263 Fusly, having been in Raipore about one and a half year and in Nagpore 9 months and ever since his return he has had the entire management of the dependency. These particulars are authentic, and may in a great measure be corroborated by public records in Raipore and Nagpore. Dulgunjun Sing is now rather more than 30 years of age, not deficient in intelligence or capacity but of an exceedingly overbearing and unconciliating proud disposition, which renders him as inaccessible to the people as they appear re-

luctant to seek his aid and counsel. He is hasty in his acts, quick in his temper and very indolent in his habits. Such is the character he universally bears, confirmed by my own observations; and but for the desire he expressed of being allowed the advantage of proper direction and guidance, the consideration of his not hitherto having been fortunate on securing the control and interest of the state by whose direction he might have been fitted, and the very early age at which he became involved in his troubles, I could not have recommended his being retained in the management of the dependency even as a probationary measure.

Takolee and Balance.

13. It is stated that formerly no tribute was paid by the Rajah of Bustar to any acknowledged superior state, but that in the time of Daryao Deo (the great, grand-father of the present Rajah) his younger brother Ajmeer Sing having rebelled against him, ordered to deprive him of the throne, Daryao Deo applied to the Nagpore Government for assistance to enable him to retain his inheritance and overcome his brother which was granted on the condition of his acknowledging his allegiance to Nagpore and paying an annual tribute to that state. At page 249 of Sir Richard Jenkin's report it is stated that "the tribute of Bustar was nominally 10,000 Rupees but as it was "payable in cowries, the value of which was subject to constant "variation, it was considered desirable to commute it to a pay-"ment in silver and 5,000 Rupees being considered a fair equiva-"lent, it was fixed at that amount and a remission of one-fifth "allowed while Rotepal and its dependencies are separated from "Bustar." The tribute at that time therefore amounted to 4,000 Rupees which has remained without alteration up to the present time. In the year 1240 Fusly the Rajah of Bustar gave over the whole of the Sayer collections of the dependency together with the talook of Shawah in lieu of the Takolee, but no document explanatory of this arrangement can now be found. When Dulgunjun Sing visited the Rajah in Nagpore he petitioned that the former arrangement of a money payment might be reverted to, and the Sayer and Talook of Shawah restored, but the original papers were not at that time to be found and no change was made. The Sayer includes besides the transit duties, bazar tax &c, the whole of the Abkaree, and as much of the Pandree as accrues from the loom

tax or payment levied from the village weavers (Gandas) of the dependency who are a numerous class. This (including Shawah) was rented out for the past year 1265 Fusly for Nagpore Rupees 5,000; but as many advantages may be expected to arise from a department whose operations are so widely spread and means of information so constant and varied when retained in the hands of Government, I have determined for the ensuing year to put the Sayer of Bustar under active Khalsa management, exacting periodical Reports and Returns and as strict an enquiry as circumstances will permit into the Collections and traffic of the dependency. The Talook of Shawah had in the year 1264 Fusly been under contract, but is now under Khalsa management, and yields a rental of Nag. Rs. 1,000. There is therefore no outstanding balance of Takolee due from the Bustar dependency, but rather during the management of the equivalent transferred, a profit has accrued to the Government. During the visits of Dulgunjun Sing to Nagpore however he has received on different occasions from the Government Kotee at Nagpore and from the Treasury at Raipore, the following sums for private expenses.

| | | | |
|---|---|---|---|
| In 1256 Fusly ............ | 1,056 | 0 | 0 |
| ,, 1259 ,, ............ | 25 | 0 | 0 |
| ,, 1260 ,, ............ | 347 | 2 | 8½ |
| ,, 1261 ,, ............ | 212 | 5 | 2 |
| ,, 1262 ,, ............ | 1,47 | 0 | 11 |
| Total Rupees .... | 3,110 | 8 | 9½ |

The whole of this amount has now been transferred to the Raipore District accounts. When the last amount was paid in Nagpore in the year 1262 Fusly, the Rajah ordered the whole sum to be recovered by annual instalments of Rupees 1,000 each from the year 1268 Fusly and the remainder namely Rs. 110 -8-9½ in 1271 Fusly.

14. Of his debts I have not been able to obtain from the Rajah any detailed Statement* but from the number of complaints received they would not appear

Debts.

* Since forwarded and attached to the Proceedings.

to be very great, amounting as far as can be judged from such data to more than Rs. 15,000.

Jurisdiction.

15. The most difficult question connected with this large dependency appears to me to be the extent of jurisdiction Civil and Criminal to be vested in the local authority in charge of its affairs. The great distance of Jugdulpore, the Rajah's residence, from Raipore, about 200 miles, the amount of population and large tract of country to be carried for, render it absolutely necessary that a more than usual power of hearing and deciding such cases should be delegated to whomsoever may be entrusted with the management of the dependency; but the extreme difficulty of ascertaining the qualifications of the person employed to exercise sufficient powers, and the almost impossibility of effectively supervising his acts and operations, render it worthy of consideration whether the object could not be more successfully attained by the appointment of a Government Judicial Officer at Jugdulpore, whose presence would also materially assist our efforts in developing the resources and condition of this much neglected district. It is stated at page 248 of Sir Richard Jenkins' Report that " When the province of Nagpore was formerly under " European Superintendence, in Bustar no attempt was made to " put new restrictions on the Rajah in regard to the exercise of " unlimited power in Judicial matters or in Sayer Collections." And this understanding has up to the present time continued. As it appeared advisable however that some explanation on this subject should be made without delay, leaving the exact limitation and future arrangement to be settled hereafter, I issued an order directing all heinous offences to be committed to my Court, and generally indicated the advantages and necessity of one uniform system of legislation, as practiced in the country under our administration, extending also to the dependencies attached. From the proceedings also will be seen the nature of the orders given to the Thanadar at Jugdulpore, who has been instructed to take the deposition of any one who may seek his aid complaining of injustice, ill treatment or misdemeanour of any sort on the part of the authorities in Bustar, or who has failed to obtain redress on a representation to the manager, of any grievance, or matter in

which the interference of the Government may appear necessary, merely forwarding the statement, without entering into any investigation, for my orders, with an Urzee explanatory of the circumstances of the case.

Meria Question.

16. From the unorganized state of this dependency as previously described in this letter, the character hitherto borne by Dulgunjun Sing while uncontrolled by any superior authority, the limited time at my disposal and the necessity for my early return to Raipore, I did not deem it prudent after the extended and conclusive enquiries made by the Officiating Agent for the Hill Tracts of Orissa, to agitate at this time the further investigation of the Meria question, in the fear of being either inevitably detained, or of having to adopt the unsatisfactory alternative of breaking off in the middle of my labours. The extreme shyness of the people also, and the difficulty of obtaining information, the over-anxious caution evinced in replying to the most ordinary questions, and the apparently systematic manner in which the villagers avoided all intercourse, or reluctantly responded to all such attempts, which has been so happily contrasted since my circuit emerged from Bustar, impressed me with the idea that some means had been used to discourage the people from freely communicating with my camp independent of the consideration of their natural aversion to come in contact with strangers, I therefore rested content for the present with renewing the stipulation for the suppression of human sacrifice and issued fresh instructions to the guards at Jugdulpore and Duntewarrah. In compliance with your sanction contained in para 7 of letter from your office No. 44 dated the 28th July 1855, guards of the strength therein laid down were dispatched in the month of October of last year and reached their respective stations in November. Form the unfavorable season at which they were dispatched however, or from their not being acclimatized, the greater part of them, including one of the news-writers and a Jemadar, were obliged to return almost immediately, and the rest have with difficulty recovered and been prevailed upon to remain. The guards have now again been completed, and I have written to the Agent for the Hill Tracts, to supply me with a news-writer in

place of the one who has been obliged to leave, of experience in pursuing enquiries on such subjects as that more particularly recommended to the notice of the Thannahs of Dhuntewarrah and Jugdulpore, and also to furnish me with a copy of instructions usually given to subordinate Officers in charge of detached Thannahs in the Hill Tracts together with any other suggestions that may strike him as being of use or importance in connection with the subject. As mentioned in para 15 the news-writers will report the case of any complainant and furnish periodical monthly reports of all circumstances and occurrences worthy of note, and affecting the well-being of the people of Bustar. On account of the irregularity of communication, and on the representation of the news-writer as well as on that of the Burkundazes who complain of their isolated position, I arranged that every two months one Burkundauze from each Thannah shall proceed to Raipore on leave, bringing with him the reports of the news-writers in which shall be noted the previous reports with contents and date of despatch, thus ensuring early notice of any interruption. I would again also earnestly draw your attention in reference to this subject to the incalculable advantages that would arise from the opening of a road through the dependency of Bustar on account of its inaccessibility during two-thirds of the year, the immense extent of country left without intersection, its peculiar circumstances and condition, and the increased degree of attention that will require for the future to be bestowed upon it. The construction of a road, which would bring the transaction of the affairs of this dependency more immediately and speedily under the control of the district Officer at Raipore, presents no other difficulties than its length and the expense attendant. The soil is admirably adapted, no obstacles are presented by the physical features of the country, and a line from Dhumterree, the station of a Tahsildar, to Jugdulpore will lead directly on to meet the road now under construction from the Coast at Parwatipore.

Goddess Dhunteswarry.

17. Having arrived at Jugdulpore and found the state of the accounts and other dufter papers to be such as to require a few days, preparation and arrangement, I determined on proceeding to

Dhuntewarrah to inspect the Tannah and guard, as well as the temple of Dhunteshwaree, which has not before been visited by any European. Dhuntewarrah is situated in a dense jungle about 60 miles S. W. from Jugdulpore, at the confluence of the Sunknee and Dunknee, tributaries of the Indrawutty, and is said to be nearly in the centre of the dependency. The village contains about 50 houses principally occupied by persons connected with the temple, which is the chief object to be noticed in connection with the village and to which it owes its origin. There is nothing imposing in the appearance of the temple, which is a low terraced-roofed building, thatched over, about 50 yards long with walls partly of stone and mud, and partly of brick and chunam, the shrine of the the goddess being at one end. There is another temple along side, of the same description but smaller, containing also a goddess, and a third in front of the original temple, but under the same roof, containing a representation of Bhyro Deo. As before mentioned, Dhunteswarree came from Wurrungul with the first Rajah of Bustar, Aumun Deo, who built the original temple with a small shallow well for sacrificial purposes about 18 yards in front of it; a room was added to this by Poorooshottum Deo, the fourth Rajah; a further addition enclosing the place of sacrifice was made by Drikpul Deo the eleventh Rajah, and lastly the small temple by Bhyro Deo the fourteenth Rajah. A plan of the temple has been annexed, the dimensions of which have been estimated by the eye. Dhunteswarree is said to be an incarnation in the form of Droupuddy the wife of the five sons of Pandoo, and is represented as a black female standing, one foot being on the ground and the other on the back of a Lion, with six arms; three on the right side holding a shell (shunka) a sword (khudga) and a three-pronged spear (trisool) and three on the left holding a bell (ghunta) a rope (pashya) and the third grasping the hair of a giant whose form has sprung from the neck of a buffaloe which has just been decapitated. A representation of the Idol which is about 4½ feet high has been made and is attached. The goddess in the smaller temple of which no further mention will be necessary represents "Kalee" and receiving also the name of "Peddummah." It has ten arms, and differs in no meterial respect from the ordinary representation of this goddess. The Idol was brought from Bar-

soor, where it had formerly been worshipped by the Rajahs (Gun-gabunsu) of that place, by Dulput Deo the thirteenth Rajah. The talook of Dhunteswarrah, consisting of all the land included within a circle of 8 coss (gondee) or about 28 miles on every side of the temple, has been alienated for its support. It is at present a dense jungle and is said to contain about 100 villages. It is under the control and management of the Poojaree of the temple supervised by a Kardar appointed by the Rajah. The Poojaree is of the Rajpoot caste, and the office has been in his family since the establishment of the temple; he is said to have followed the goddess from Wurungul. He has no fixed allowance, but receives the daily offering to the goddess, consisting of—

2½ Phylies of Rice.

1 Do. of flour made into cakes besides ghee, milk, &c. A sacrifice does not necessarily take place every day but is confined to the days noted below; though those visiting the temple are not restricted. The establishment attached to the temple is as follows:

| No. | Rate. | | | Amount. | | |
|---|---|---|---|---|---|---|
| 4 | 24 | 0 | 0 | 96 | 0 | 0 |
| 1 | 20 | 0 | 0 | 20 | 0 | 0 |
| 4 | 15 | 0 | 0 | 60 | 0 | 0 |
| 9 | 12 | 0 | 0 | 108 | 0 | 0 |
| Total Nag. Rs.. | | | | 284 | 0 | 0 |

| | NAMES. | Yearly emolument. | | |
|---|---|---|---|---|
| 1 | Thannadar on the part of Rajah (besides feeding)........... | 84 | 0 | 0 |
| 1 | Kardar.................. | 60 | 0 | 0 |
| 2 | Lamp lighters (Toorpas) at 20 Rs. | 40 | 0 | 0 |
| 2 | Bhaldars at 15 Rupees each.... | 30 | 0 | 0 |
| 2 | Keepers of Jewels and Stores at 20 Rs.................... | 40 | 0 | 0 |
| 1 | Nagarchee..... } Musicians at 12 | | | |
| 1 | Mohreah...... | | | |
| 1 | Bhujniah...... | 72 | 0 | 0 |
| 1 | Dolemah...... | | | |
| 1 | Dhuppermalah | | | |
| 1 | Tootareah...... | | | |
| 1 | Tailor.................... | 12 | 0 | 0 |
| 1 | Mashaljee.................... | 12 | 0 | 0 |
| 18 | Peons as per margin........... | 284 | 0 | 0 |
| | Total Nagpore Rupees.. | 634 | 0 | 0 |

The days appointed for sacrifice are:

1 At the new moon of the month of Srāvun when a sheep is sacrificed.

At the full moon of the same month when Rukshbundham or a red thread is tied to the arm of the goddess, and the same thread is sent to the Rajah.

At the 3rd increasing moon of Bhado, when new clothes are given to the goddess.

From 7th decreasing to the new moon of Katik, when every day the goddess is bathed at day break with the water of Mata Talao at Dhunteswarree, and worship is finished by 7 o'clock A. M. On the new moon the goddess is adorned with ornaments and the doors of the temple are open all day; so that all may come and visit the goddess. Mukersunkrantee on this day sweetmeats are offered.

Seo Ratree 14th decreasing moon of Phag, from the evening to the day-break (7) seven times the worship of the goddess is performed. Two new cloths are offered on that day to the goddess, and three to Bhyro Deo.

From 7th increasing to full moon of the same month. These 9 days the palanqueen of the goddess is taken to the Mata Talao at 3 o'clock P. M. On the last day new cloths are bestowed to all the servants of the goddess.

In every month 2 new cloths are given to each of the two goddesses. In Chait and at the Dussera new cloths are given to Bhyro Deo.

When any marriage is celebrated in the Rajah's house, or when the Rajah first mounts his throne, the whole family of the Rajah go to visit the goddess; and at that time not less than 1,000 sheep and buffaloes are sacrificed. This is called Cootoomba Jātra. The jewels belonging to the idol are valued at about Rupees 15,000 and as formerly mentioned are worn by the Rajah during the Dusserah when he sits upon the Ruth. Temples containing representations of Dhunteswarree under the name of "Maolee" exist in almost every village throughout Bustar. Her name is borne upon the seals of the Rajah, and she is looked upon as the patron Saint of the family and the dependency.

Climate.

18. My visit to Bustar has been so hurried that I have not ventured on any decided opinion with regard to he climate. It is true that those visiting the

country for the first time rarely escape sickness, principally fever, but except the extent of jungle and the stagnation of the water in the beds of the rivers and streams, on account of the general flatness and slight degree of water shed, I am not aware of any predisposing tendency in the climate to produce sickness. The Indrawutty, the chief of the river system, is an exception, its stream being rapid and constant; its water are suffused with a fluid resembling oil or bitumen which increases on being kept, and on first arrival the use of this water, I have no doubt, must be injurious, as my camp suffered most at this station from fever, some of my people being unable to accompany me to Dhunteswarree. As all entering the dependency, almost necessarily pass through Jugdulpore, this place may have contributed not a little to the reputation it has of being unhealthy. Sickness is said to prevail most in the months of July and October.

Proposed Management.

19. The system of management that has been recommended for adoption in Bustar together with forms and simple rules have been attached to the vernacular proceedings; a statement of an establishment of strength proportioned to the funds available according to the accounts produced is attached.

20. The lines of traffic and merchandize passing through Bustar have already been noticed in paras. 6 and 7 of my letter, No. 207 dated the 6th December 1855.

I have the honor, to be,
Sir,
Your most obedient servant,
(Signed) C. Elliot,
*Deputy Commissioner.*

Chutteesgurh,
Deputy Comr.'s Office,
Joonagurh,
*27th May*, 1856.

### III.—*A Brief Account of the Ancient Buddhist Sculptures at Masulipatam, lately in the possession of* Mr. Alexander, *from which the restored form of the Dagobahs or Topes is obtained.* By Major H. Congreve.

These remarkable and very beautiful Sculptures were brought from some ruins situated at Omaraputty, on the right bank of the river Kistnah about twenty miles above Bezwarrah. They were first discovered or noticed by Captain C. Mackenzie, at that time Surveyor General, who selected a number of stones which were forwarded to Calcutta early in 1819; subsequent to which, those at Masulipatam were brought there with the view of erecting some building, where they lay for eighteen years or more before they were given to Mr. Alexander. The height of the Masulipatam stones varies from two feet to eight; the breadth being from five feet to three; the average thickness eight inches; and the number of stones is twenty-eight.

Some of these stones are of a tall oblong shape, having wrought on them two large ornamented circles or medallions joined by an upright band; and having the medallions filled with groupes of men and animals, illustrative of passages in the life of Buddha, the spaces on each side of the band being likewise covered with sculptures of processions, groupes of musicians, &c. On the top of one of these stones, surmounting the upper circle, appears an altar with figures worshipping in front of it, the bottom of the stone has figures of the lion, dragon, and elephant. In some of the sculptures, for the lower circle is substituted a semi-circle, whose diameter is the upper line of the plinth (if I may use the expression) of the stone. Other stones are square, both sides of which are flanked by a pillar; the middle of the stone is occupied by a Dagobah, on the front of which appear five columns supported by rampant lions. The dome is richly ornamented with festoons of chain and flower work. The base of the temple is crowded with sculptures, of human beings, animals, &c. Amongst these stones is one most perfect and beautiful, profusely adorned with the most elaborate sculptures. The great value of these latter stones consists in their affording, what I believe to be, a perfect picture with all the architectural details, of the Buddhist Dago-

bahs of Ceylon and the Punjab. I have given a drawing of one of these Sculptures, but my details are not so elaborate as in the original. What remains of the Manikyala tope in the Punjab contributes much to verify my conjecture.

Some broad steps (now mostly ruined) lead to the base of the tope. Round the base is a moulding on which are pilasters about four feet high and six feet asunder; these have plain capitals, and support a cornice marked with parallel lines and beadings. The whole of this may be seven or eight feet high, from the uppermost step to the top of the cornice. The building then retires, leaving a ledge of a foot or two broad, from which rises a perpendicular wall about six feet high; about a foot above the ledge is a fillet formed by stones projecting a very little from the wall, and at the top of the wall is a more projecting cornice. Above this complex basement, which may be taken to be from sixteen to twenty feet high, rises a dome approaching in shape to a hemisphere, but truncated and flat near the summit.

The Masulipatam stones and others I have seen in India, are singularly like the ancient upright stones found in Great Britain, on many of which, at a period subsequent to their erection, have been wrought crosses by the early Christian Missionaries. Many of the British stones, like the first class of the Masulipatam Sculptures, have circles wrought upon them, for example the centre stone of the Aberlemno groupe in Scotland. The right hand stone of the same groupe is very like a stone found by Mr. Kittoe in Cuttack, and the left hand stone of the Aberlemno stones is actually the same thing as the Nagum or sacred snake stone set up for worship in India.

Mr. O'Brien in his "Round Towers of Ireland," describes several ancient stones in Ireland, on which occur the rhinoceros, elephant, tiger, and objects that maintain the same places on the stones in India, and the originals of which are animals belonging to the East. The religion of the Scandinavians was a type of Buddhism, and the Druidic superstition a modification of Brahminism; hence these singular resemblances.

IV.—*Discours de M. Garcin de Tassy, membre de l'Institut á l' ouverture du cours d'Hindoustani, á l'Ecole Imperiale des Langues Orientales vivantes, le 7 Fevrier* 1861.

PARIS, HENRI PLON.

We have to acknowledge with many thanks the very interesting opening address delivered on the 7th February last by our distinguished Honorary Member, M. Garcin de Tassy, the learned Hindustani Professor at the Imperial School at Paris, specially devoted to the study of the living Eastern languages.

M. Garcin de Tassy is as remarkable for the singular ability he displays as a teacher, as for the invariable kindness and courtesy he has always shown to all Englishmen who attend his lectures. M. de Tassy was the favourite pupil of the late eminent Sanscrit scholar, M. Burnouf, and his annual Lectures and numerous published works have constituted him the legitimate successor to the European reputation of that great Orientalist, his master and friend.

Numerous references and allusions in this opening address prove that M. de Tassy has many valued correspondents among the oriental scholars of England and India, and that he eagerly and attentively watches the progress of Hindustani literature in the various parts of India where it is cultivated. He notices the Hindustani newspapers and periodicals which have appeared since 1859, at Surat, Ajmir, Peshawur and Delhi; and the detailed history of the Indian rebellion, "Tārikh-i-baghāwat-i-Hind," by Mukand Lāl, Sub Assistant Surgeon and Anatomical Lecturer at the Agra Medical College.

M. de Tassy also describes the Hindustani "matineé musicale," given at Madras in December 1859, by an Indian singer of great talent, a pupil of the celebrated poet, Daya Ram, author of the "Daya-vilās," or Pleasures of Clemency.

M. de Tassy notices the articles in recent numbers of this Journal (N. Ser. No. VIII. October—March 1858-59, and No. X. October—March 1859-60,) by Messrs. Walter Elliot, W. Bayley, M. Norman and the Revd. Dr. Caldwell, on writing Oriental languages in the Roman character. It will be gratifying to those who have laboured and take an interest in this subject, to know that

they may to a certain extent include so eminent an Orientalist as M. de Tassy among the advocates of the Romanising system. It is true that he at present only goes so far as to say that it cannot fail to be useful to "beginners, and to those who content themselves with a superficial knowledge of the language;" but this admission will, we conceive, be accepted by our Romanising friends as an ample and plenary concession of the whole argument; for all must be beginners, and all must attain a superficial before they arrive at an erudite knowlege of a language; and if, as M. de Tassy grants, these preliminary steps can be gained more easily, and more accurately, through the medium of the Roman letters, how can it be shown that for the higher steps, and for greater perfection as a linguist, the student must resort to the puzzling and imperfect Arabic and Nāgari alphabets? Idiomatic fluency and the colloquial command of language, cannot be in the least advanced by acquiring the greatest dexterity in deciphering "Shikastah" scribbling; and all that is required to give our Romanised students the fullest and most extensive insight into the treasures of Oriental literature, is the publication of all the standard works in the Roman character. A very distant prospect, it is true,—but something has been done, and if we could effect the full conversion of M. Garcin de Tassy and a few more eminent scholars to the true Roman faith, we should not despair of great progress being made in a very few years.

M. de Tassy himself observes that two Romanised editions of the Bagh-o-bahar have recently been published, "One by the indefatigable Duncan Forbes, and the other by Monier Williams, the worthy successor of Wilson in the chair of Sanscrit at Oxford."

He speaks in terms of high commendation of the Bible Society's recently published edition of the New Testament in Hindustani, prepared by the Translation Committee of Benares. "The style" he says, "is pure Urdū, and ought to satisfy native critics. However I must claim the right of disapproving of the use of the barbarous words, *Abiraham*, *Patras*, *Yarusalam*, *Surya*, *&c.*, instead of *Ibrahim*, *Butros*, *Yurashalim*, *Sham*, *&c.*, adopted throughout Eastern Christendom to signify Abraham, Peter, Jerusalem, Syria, &c."

With great deference to M. de Tassy's opinion, we suspect that as an Arabic and Persian scholar he is more familiar with the terms used by Oriental Christians where those languages are spoken, than with those which were used in India many centuries before any part of the Bible was translated into Hindustani. The founders of the ancient Christian Church on the western coast of India seem to have known their native land by its old Hebrew name of Surya, rather than by the modern Arabic name of Sham, since the native Christians on the western coast, from time immemorial, have always called themselves "Suryāni." Therefore it is but natural and reasonable, in a Hindustani translation of the New Testament, to use words that are already familiar to Indian Christians, rather than to go to the Arabic language for words of more recent origin and less correct etymology, such as *Sham* and *Butros*, merely because they are adopted by Oriental churches of greater pretensions and more imposing appearance, than the poor though venerable churches of Malabar and Travancore.

One of the forms preferred by M. de Tassy, *Butros*, is obviously the mere result of the absence of the letter P from the Arabic Alphabet. In India the name *Patras* is common, not only among the Syrian Christians, but also among the Armenians who have been settled in India for the last five centuries. Why then should the correct name be banished from an Indian version of the Testament, and an Arabic barbarism—if M. de Tassy will pardon us for hurling back that missile,—foisted into it?

Hardly any event of the last two years that is in the slightest degree connected with the study of Urdū, or with the history of our Indian Empire, seems to have escaped the Parisian Professor's observation, and he treats every thing in a genial and generous spirit. He congratulates Europe upon the total suppression of the "great Indian insurrection" of 1857, which, he predicts, far "from shaking, has consolidated the power of England." He mentions with warm praise the address in the Hindustani language delivered to the young native Christians after the confirmation service at Bareilly, in last November, by the Bishop of Calcutta; and he does not forget to pay a graceful tribute to the memories of Mountstuart Elphinstone, Macaulay and Horace Hayman Wilson.

V.—*Observations upon the altered Rocks of the Neilgherries.* By Major H. Congreve.

In the course of some papers recently written by me on the Geology of the Neilgherry Hills, I had occasion to observe that a crystalline rock of Syenite pierced by Trap was in part converted into a Schistose rock. Since then I have had many opportunities of observing the action of Trap on the rocks it has perforated, particularly Syenite and a Granite of two ingredients, viz., Quartz and Felspar. The sides of the fissure in many of the Granite rocks of this composition, subsequently filled by igneous injection are altered into a lamellar Granite and Siliceous Schist.

Having carefully studied the mineralogical arrangement of the crystals of the Schist, Schistose Syenite and Granite and the subject generally, I am induced to believe that the following is a true history of the change. To make it more clear I divide the operations wrought by dynamical and mechanical forces into several periods illustrating each by a diagram.

*Period the first.* In this early stage of the phenomena we suppose a mass of Granite rock composed of Quartz and Felspar to have been rent by some natural convulsion; and the rent to offer a free duct for the discharge of certain volcanic substances from the interior of the earth to its surface, such molten fluids not having yet brought the sides of the chasm through which they pass into a liquid state.

*2nd Period.* The incandescent fluid having continuously passed through the fissure has at length imparted to the sides of it, so great a degree of heat as to produce a state of fusion amongst its minerals: the Quartz not being so highly fused as the Felspar owing to its greater degree of infusibility.

*3rd Period.* By this time the sides of the chasm have become so much liquified by the heat of the injected substances as to lose all adherence; and the dynamical force of the trap rushing through the fissure acts upon the molten rock which environs it. The Trap in other words blends with the molten Granite at the points of junction and carries it forward with it.

*4th Period.* The crystals of Quartz are perfectly vitrified when in absolute union with the Trap, and by intimately blending with it, contribute to form Sydian stone and other Siliceous Traps. As they recede in distance from the molten matter they are necessarily in a lower degree of fusion. The effect of the dynamical action will therefore only tend to elongate their crystals, throwing the longer ones into a parellelism with its direction. They are all probably however in a state of onward motion, a motion that diminishes in intensity according to the distances of the crystals of Quartz from the motive cause. Figure 3 will explain this.

*5th Period.* At this period the passage of the Trap through the fissure suddenly ceases. Pressure acts upon the rock and the stratified Granite not yet cool is consolidated into a Siliceous Schist, or to be more plain, the elongated crystals of Quartz in the rock are flattened by pressure and brought into almost immediate contact with each other, while the more easily yielding Felspar is squeezed out between them, a very small stratum of it remaining. Any person who could have the opportunity of observing the altered rocks of the Neilgherries would find they present appearances corroborative of the foregoing history. With reference to the first period there are many rocks pierced by Trap, the sides of whose rents are unaltered, because its injection ceased before they had time to melt.

Referring to the 3rd Period, Geologists are well acquainted with what has been termed the passage of Granite into Trap, the difficulty in accounting for which I think I have surmounted. Dr. MacCulloch has stated he has observed the passage of Granite into Trap. I should rather say he observed an illustration of my theory.

Illustrations of cooling in the crystals having taken place at the conclusion of the 4th Period when no pressure operated, may be seen in the altered Syenite and Granite rocks of the Hills. Granite passing into a Schistose Granite, and the latter altered into Siliceous Schist, may likewise frequently be seen. The modified form of Trap into Trap Porphyry which occurs traversing crystalline rocks in thin veins, may in a great measure depend on similar

operations, the fluid Trap while cooling having taken up small fragments of Felspar, &c., from the sides of the chasm it invades.

On putting forth this paper I anticipate being met with an objection from Mr. Dela Beche who states "the term 'altered rocks' is at present exclusively applied by Geologists to that modification of mineral structure which has taken place in rocks since their production through the agency of heat; it being understood that the heat has never been sufficiently intense to produce fusion." In my own defence, if it be necessary to enter into a defence after the foregoing account of what I have actually seen, I beg to remind Geological readers of the following facts.

1st. The Oolitic rocks and chalk in junction with Trap, have been found fused and converted into crystalline marbles.

2nd. Coal has been converted into coke through the agency of the enormous heat of the Trap.

3rd. Sulphur has been sublimed.

Dr. Buckland and Mr. Conybeare witnessed instances of the conversion of chalk into crystalline limestone by basalt in the country of Antrim. If I have made correct inductions from what I have witnessed in the altered rocks, a strong temptation is held out to ascribe the formation of Gneiss and Hornblende Schist which passes by imperceptible degrees into Granite and Syenite, to the agency of incandescent Trap matter moving with enormous velocity across the Granite and Syenite.

To me it seems more philosophical to conceive that such an operation as I have described, changed the crystalline rocks into Gneiss and Hornblende Schist, than to employ a combined theory of aqueous deposition and subsequent Plutonic action, as some Geologists have done.

## VI.—*Notes on the Yoon-tha-lin Karens, their History, Manners and Customs.* By Captain W. G. Stoll, *2nd Madras European Light Infantry, Assistant Commissioner, Martaban.*

When in 1853, the Kingdom of Pegu was annexed to our Indian Empire by Lord Dalhousie, it followed as a matter of course that we should be brought into contact with peoples and tribes of whose very existence up to that time we were quite ignorant, and although this remark does not apply in its fullest sense to the Karen people, yet beyond a few Missionary records very little was known regarding this singular race before the annexation. Before entering on the particular subject of the Karens, it will be necessary to give a brief general sketch of what is called British Pegu.

It may be said to comprise the country lying between the Irawaddy and Sittoung rivers as far north as the latitude of the frontier station of Meeaday: a range of hills of no great elevation divides the watershed of these rivers; the rest of the province is generally low ground, covered more or less with dense jungle.

The races living in Pegu are the Burmese, the Taleings, the Karens and a few Shans.

The two former reside in towns and villages, situated near the bank of some stream navigable for small boats; the Karens on the other hand generally avoid the society of other races, and live in small communities situated in deep ravines or in dense forest.

When the Sittoung river is crossed, the physical features of the country greatly alter, the plains give way to mountains of considerable elevation covered with primeval forest, from whose wooded valleys flow perennial streams of water. This mountainous country extends as far as the Salween river, which is our Eastern frontier; on that side in a northerly direction its limits are not correctly ascertained, but it stretches away far beyond our frontier. It is this region which is "par excellence" the home and dwelling place of the Karens subject to our rule; and it is also sub-divided into two districts, the one belonging to Toung-oo, the other to Shooay Kying, of this latter and southern sub-division it will be our province to speak.

The Shooay Kying portion of these mountains has been loosely and inaccurately styled the Yoon-tha-lin (from a river of that name) and for want of a better term this nomenclature will be preserved.

The Yoon-tha-lin then is a mountainous district lying between the Sittoung and Salween rivers with an approximate area of about 4,000 square miles. The direction of the hills is from N. N. W. to S. S. E., and their average height about 3,500 feet; there are several ranges of them, and between each range flows a considerable stream. Travelling eastward from the Sittoung river, it would be necessary to cross three high ranges of mountains and two rivers before the banks of the Salween are reached.

The upper Yoon-tha-lin is a contracted valley hemmed in by pine-covered hills often impassable; the features of the lower part of the valley are less rugged and the vegetation partakes more of that of the plains.

The climate is agreeable—its mean temperature about 70°; the summer heat is very endurable, and in the cold weather night frosts are frequent. The fall of rain is considerable, it cannot be much less than 180 inches; and the Monsoon commences earlier and lasts longer than in the low country. The district is very feverish, as might be expected from such an extent of forest ground.

As other races will be introduced into this narrative, a brief account of them will perhaps not be uninteresting.

Across the Salween river, live the "Yody-ah" Shans, or Siamese; these are an ugly swarthy people of short stature and Tartar physiognomy.

At the N. E. angle of the "Yoon-tha-lin" we encounter the Karennees or *red* Karens, so styled by the Burmans, but apparently incorrectly so, for they have no affinity with the Karen Byoo or ordinary Karen. In the word Karennee, the last syllable "nee" is the Burmese word for "red colour," and the Karennees are so called because they wear short red breeches and a red turban.

They inhabit the high table land beyond our frontier. They are a race of mountaineers with all the virtues and vices peculiar to

such a class ; in appearance they are well made, rather slight but exceedingly active. A strange mark distinguishes them ; on the broad of the back is tattooed an outspread leaf of a tree. A good many years ago the Karennees were a people under one ruler, subsequently they separated into Western and Eastern Karennee, who are at constant feud with each other. The former is the weaker State, and has always sought our acquaintance; the latter much more numerous has shown its hostility on every possible occasion. Beyond the Karennee country live the Burmese Shans, commonly called the *Ko-soobwah* or "nine principalities." These people are evidently a Mongolian race, and possess strong trading predilections. Every cold season considerable caravans of them come into our territories for the purpose of buying, selling, or bartering. Lastly there are the Toung-thoos or hill men, very like the Shans in appearance ; but very little is known of this people.

We thus have White Karens, Red Karens, Siamese and Burmese Shans, and Toung-thoos,—all distinct races,—at least the one cannot understand the language of the other,—and however tedious this enumeration may be, it is essential to enter upon it, for without some such explanation the history and customs of the Karen people could not be well understood.

The want of a written language, the consequent absence of all records, and the imperfections of a rude oral tradition, render any attempt at stretching the past history of the Yoon-tha-lin Karens by no means easy. The people themselves know very little of their own history, and what little is learnt from them, is so mixed up with fable and superstition that it is difficult to trace the thin vein of truth amidst so much improbability and so much absurdity. Their own statement is, that they originally came from the table land to the northward, now inhabited by the Karennees, and that about three centuries ago they were expelled from thence and migrated towards the south.

Whether at this period they were one united people or whether at a much earlier stage of their history a separation into different tribes took place, it is now impossible to say ; but the fact remains that at present there are three great divisions of white Karen

people,—the *Dau-bya* inhabiting the hills in and to the northward of the Toung-oo district; the *Sgau*, residing in the Martaban Province, and the "*Pgh̄o**," occupying the hilly country south of the Salween river. In appearance there is a strong family likeness between these three tribes, indicative of a common origin; but, strange to say, the dialects exhibit most marked differences.

A very singular feature in the Karen language is the possession of two letters which have very nearly the same power as the two. Arabic gutturals the Khai and the Ghain. The neighbouring nations have no such sound. We do not pretend to build any hypothesis upon this fact, but in itself it is curious and worthy of remark.

The Yoon-tha-lin Karens belong to the *Sgau* family. The word *Sgau* in Karen language means a fowl; and the tradition connected with this bird is, that a copy of their sacred writings was once mislaid or lost and brought to light by the scratching of a fowl in the dust.

For the last two centuries the history of the Yoon-tha-lin Karens presents nothing very remarkable. During the period that the Taleing Kings reigned in Pegu, the country was more prosperous and much more densely populated than it is now; but when the Burmese conquered the country, their deadly shadow, like that of the fabled Upas tree, destroyed everything—cities, population, wealth and commerce, alike vanished; and the Yoon-tha-lin became to all intents and purposes a howling wilderness. Now and then, the Yodyah Shans or the Burmese would make a foray into the country, for the purpose of exacting tribute or of capturing slaves; but with these exceptions the Karens lived quietly and undisturbed in their mountain fastnesses.

During this time however arose a species of prophet amongst them, one of whom in our own times has given the Government no small amount of trouble. I allude to men styling themselves

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NOTE.—* The sound G H is the same as that of the Arabic letter ghain.

" Min Loung" this appellation in Buddhist Theology means " the godhead on earth in the flesh" answering to the Hindoo Avatar. At uncertain intervals some man calling himself a " Min Loung" has appeared amongst the Karens, and as they are firmly impressed with the truth and dignity of this title, the so-called " Min Loung" of the day has never had any difficulty in raising a large band of followers and in carrying out such schemes as his ambition might point out.

When the kingdom of Pegu was annexed by us, the Yoon-tha-lin district shared the same fate, and was attached to the Martaban Province. Up to this period, little or nothing was known of the country, but in the beginning of 1856, Major Allan, then belonging to the Quarter Master General's Department in Pegu, was directed by Government to lay down the N. N. E. and E. boundary of our newly acquired possessions. This Officer and his companion in this expedition, the Deputy Commissioner of Shooay Kying, were the first Europeans who penetrated into these remote regions.

The Karens in the mean while had given in their adhesion to the British Government, and quietly acquiesced in its rule. But in the course of the year 1856, a change was at hand. At the very time that the frontier was being surveyed, a Dallah Karen from the neighbourhood of Rangoon arrived with a few followers into the Yoon-tha-lin district, and gave out that he was a " Min Loung." The Deputy Commissioner, well acquainted with this tradition, and foreseeing that it contained the germs of much trouble, endeavoured to apprehend him, but without success. Various accounts are given regarding this impostor, but it is generally believed that he was for a time at an American Missionary School at Rangoon; saw a little of the world at that place, and at Moulmein, and having learned at either or both of these places some conjuring arts, conceived that he was now able to play the rôle of a " Min Loung."

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Note.—The word Min Loung literally means an embryo or unfinished King. Thus the various pre-existing Boodhs who have attained unto " Nirwana." are always spoken of in their earlier stages as " Purra-loung," the imperfect God

His natural astuteness, his plausibility, his accurate knowledge of Karen nature, rendered this task an easy one amidst so superstitious a race. Before long he collected a considerable force of armed men, and proclaimed himself "The King of the Karens." Whoever submitted himself to him was treated with forbearance; whoever was not with him was attacked and plundered. Such a state of things could not be permitted to exist, and detachments of troops were sent out against him: the difficulties of the country prevented anything like decisive success, but the Karens learnt enough as to our skill in fire-arms, and did not at all admire our system of coming to close quarters. After two or three brushes therefore, they retired to their own homes; and Min Loung himself, finding that the Karens made but indifferent soldiers, enlisted the Shans and Karennees from beyond our frontier. The timid Karens shrank from these unscrupulous men. Like the fable of the frogs and King Stork, they had brought upon themselves a King who was eating into their very vitals; and for eighteen months murder, robbery and lawless violence in every shape devastated the length and breadth of the Yoon-tha-lin. Detachment after detachment went out; but the success achieved was very trifling. At length in the early part of 1858, Min Loung and his band were expelled from the Yoon-tha-lin by a combined movement on one part. An Assistant Commissioner was appointed over the Karens, to regulate their affairs, and under his orders were placed 200 armed Police, for whom stockaded stations were erected in suitable spots. With a strong but conciliating hand order was restored in a few months, and for nearly two years, crime has been unknown in the district, and the Karens have returned to their usual avocations.

Such is a brief history of the Yoon-tha-lin Karens up to the present year.

The impostor styled "Min Loung" fled into Eastern Karennee, where he is now residing with the Chief, having persuaded this latter dignitary, that at his (Min Loung's) death, his spirit will enter the body of the Karennee Chief, who in his turn will be immortalized as a "Min Loung."

We proceed now to describe the peculiar manners and customs

of the Karens. In appearance they are a short, but well made people. The colour of the skin a pale yellow, or what is called 'bamboo;' their average height about 5 feet 2 inches; and those who have mingled much with the Burmese are generally tattooed from the waist to the knee. The dress for the men consists of a coarse white cotton frock without sleeves called a "thin-deing," the bottom of the frock which reaches the knee is adorned with red stripes. The hair (which is worn long by all these races) is twisted into a piece of white muslin; the ears are perforated, and, in default of gold or silver, are generally garnished with a flower. In his hand the Karen carries a broad chopping knife for cutting down trees; over his shoulder is suspended a bag which contains a change of clothes, his betel box and a few odds and ends; and on his back, fastened by straps something like a knapsack, is an inverted conical basket called a "Now-Loway," which is of the most expansive and accommodating dimensions; and affords stowage for every imaginable article of baggage or plunder.

The dress of the women consists of a blue petticoat, over which is worn a blue "thin-deing" with a red border, and is usually trimmed with coarse white bugles. On holidays a reddish coloured head-dress with lappets is put on; some bead necklaces, brass or glass bracelets and anklets, complete their full dress toilette. Those who are in better circumstances wear a kind of cylindrical ear-ornament called a "Na-doung," in the lobe of each ear, and this is made of gold or silver.

Men and women alike carry the "Now-Loway" basket; and the latter are apparently quite as strong and active as the men, both are tremendous walkers; in fact the mere exertion of walking never tires a Karen. Over steep hills they will easily walk at the rate of 30 miles a day.

The women are not prepossessing in appearance; their faces are very broad, and, in consequence of their pedestrian habits, the leg and ancle are clumsily large, more muscular than graceful. I regret to add that both sexes are filthily dirty in their persons, and the same dress is worn for months. Now and then there are rumours of a bath having been indulged in, but the old clothes are always resumed as long as they will hold together. During the rains how-

ever, by sheer continuance of constant soaking they become tolerably clean.

In the handling of the "Da" (the Wood knife,) in carrying loads, in smoking, in chewing betel, and I am sorry to say in drinking strong drinks, no difference is to be seen in the occupations and amusements of man and woman.

The social polity of the Karens consists of a number of separate village communities, governed by a head man or "Tsaukay", who is again subordinate to some hereditary "Tsaukay Gyouk" or Head Chief of a District.

In former times these Head Tsaukays and elders of villages, inflicted punishments and decided cases, their power was quite absolute, and no one dreamed of disputing it: although at present all this has been altered, yet the office of Tsaukay is still recognised by our Government, and he manages the interior economy of his community. A Karen village almost always consists of a long bamboo house raised some 10 feet above the ground, and is invariably situated in some sequestered ravine near a stream of water and very difficult of access. This house is like a barrack with a passage down the centre, and rooms on each side. Each room is tenanted by a family man. In the centre is the fire place, over which is laid the wood and rice in the husk to dry. In a corner is a frame for spinning; a few cooking pots and some baskets to shut up their fowls in at night, complete the furniture. The young unmarried men live apart in a detached building called a "Loo-Byoo-Kan." The men are generally employed during the day in out-door agricultural work, and the women remain at home, pound rice, look after the poultry, pigs and goats, and prepare the food for the family. At sowing and harvest time however the whole village turns out indiscriminately; men, women and children all set to work with a good will.

Agriculture, and in this term I include the cultivation of Betel Gardens (the Areca Palm) is the chief and only pursuit of these people.

Every Karen as we have mentioned before carries a "Da," in the handling of which he is remarkably expert. The clearings in

the forest are called "Toung-Ya" and in their selection and preparation the following customs are observed. In or about the month of January a site for a "Toung-Ya" is proposed, the neighbourhood is then surveyed and specimens of the soil are brought home. The particular spot to be cut down is then determined by an appeal to divination with fowl's bones ; this is styled "Kyah-Yo-To"—our readers will recollect that the Karen word *Sgau* means a fowl ; it is their sacred bird. Hence it is appealed to.

The writer wishes here to point out that the words made use of in this Narrative regarding the Karens are Burmese and *not* Karen words. Those who have been in Burmah will readily recognise their meaning, and to the general reader the distinction would be immaterial. With this explanation we proceed to describe this singular ceremony.

The thigh or wing bones of a fowl are taken ; on inspecting them closely, near one extremity a small hole will be seen, the name and function of which we are not sufficiently acquainted with comparative anatomy to explain. A peg is put into this aperture—the ends of the bones are now smoothed away, and it is agreed on beforehand that the right or left bone is to win—they have hitherto been kept separate. They are now delivered to the Conjuror ; the latter then places the two bones side by side and holds them longitudinally in his right hand betwixt his thumb and two forefingers, if on comparison, the peg of the bone determined upon is higher than the peg of the other, the divination is propitious, if lower, the reverse, and the plan under discussion is *at once* abandoned.

This appeal to the Fowl's bones is the mainspring of all Karen action, whether ordinary or extraordinary, whether it be to select the site of a village or to marry a wife, to make a journey or go to battle, nothing can be done without consulting the bones. After the spot of ground has thus been selected, the forest is felled and towards the close of the hot season, it is set on fire ; what is left unburnt after the first conflagration is collected and again set fire to, until the whole is consumed.

It is incumbent on every Karen of whatever age or degree to fell at least one tree or sapling in the Toung-Ya or village clearing. After the ground has been well cleared, and the monsoon com-

menced to set in, the rice is sown. This is done by putting half a dozen grains in small spud-holes about a foot apart; the hole is not filled up; successive showers cause the grain to be covered and to germinate. Of course there is great waste, and much seed never comes up; but at present it would be as profitable to argue with the winds of heaven, as with a Karen on these points. During the rains the ground is kept constantly weeded, and in November the corn is reaped. It is forthwith threshed out by hand, and hidden in granaries near the Toung-Ya.

The Areca Palm is much cultivated by the Karens; it is always grown in a sheltered dale, through which a stream of water runs. It does not thrive beyond an elevation of 2,000 feet. These Betel gardens are very picturesque, and are usually kept very tidy; the produce of a tree in full bearing is worth about one rupee and a quarter per annum. The demand for this article amongst the neighbouring nations is quite enormous, in fact unlimited. The nut is used both green and dry; but of course it is only at particular seasons that the former can be procured.

Amongst their domestic ceremonies, that connected with the dead stands first in importance.

When a Karen dies, the whole neighbourhood repair to the spot. The corpse is placed in a separate house, round which young men and maidens continually dance. Eating, drinking and festivity are the order of the day. After the body has been burnt, the ashes are collected and again placed in the house, when the same convivial scene is re-enacted. The festivity lasts for several days according to the means of the deceased's family; for at this time open house is kept. At length the ashes are carried to the "Ayo-Toung,"—literally the Hill of bones,—and there left in a basket with a few offerings.

During the celebration of these rites, both sexes partake freely of a fermented liquor, and much drunkenness consequently prevails. At marriages, similar festivities take place, but on a smaller scale. The match is brought about by the parents of both parties. The open courting which exists amongst the Burmese

does not obtain amongst the Karens. It is considered as discreditable by them as it would be among the natives of India.

The women as a body are chaste; and connubial infidelity is rare. Separation of man and wife, adultery, or a young girl going astray, are regarded as great disgraces.

The Karens do not believe in a supreme God, but recognise the agency of two evil spirits—the one, the house "Nât," the other the jungle "Nât;" all the evils and vexations of life are attributed to the direct action of one or other of these spirits. It is deemed necessary to propitiate them, which is done by offerings of savoury food.

These statements relative to the Karens not believing in a God, and yet believing in a "Min Loung" or Incarnation, may appear at first sight contradictory. But it arises from that peculiar phase of Buddhist Theology, in which no positive God exists, as we understand the term, but only a development of successive highly gifted individuals who attain unto "Nirwana." It follows as a matter of course that the Karen is deeply superstitious; and in reality this is the case, for he dreads magic and conjuring above all other things.

Another peculiarity exists amongst this people, and it would indeed be for the benefit of mankind if the principle were more generally acted on by more civilised races. The son considers the debts of his father as obligatory upon himself. If he is unable to liquidate the debt, his children inherit the responsibility. Length of time is no bar to a claim of this nature if satisfactorily established. Regarded in a sanatory point of view their habits are open to every objection. The localities for their villages are generally badly chosen; in their persons and about their dwellings they are filthy to an extreme; their food is frequently unwholesome and they have a strong predilection for ardent spirits. The most ordinary medical treatment is unknown amongst them. If a man be struck down by remittent fever or dysentery, an offering is made to the "Nat" called "Nat-Sa;" at which time all the immediate relatives of the sick man and the patient himself must partake of animal food. The result is not difficult to guess. The rate of mortality is exceedingly high: over and over again has the

writer of this article endeavoured to get a fever-stricken patient to try our medicines, but with no success : the sick man has partaken of the " Nat-Sa," and by it he lives or dies.

The Karen women at the period of child-birth adopt the custom of the surrounding nations, and that is, the extraordinary one of seven days roasting near a large fire after child-birth. We leave it to the Physiologists of Europe to give an explanation of this marvellous system.

We have now in succession given a short account of the various manners and customs of the *Sg'au* Karens, and we shall now endeavour to say a few words on their national character and on the missionary movement amongst them.

Amongst their virtues we class first the chastity of their women, secondly, their love of home and family, thirdly, their industry, but here the catalogue ends. On the other list stand prominently drunkenness, filth and deep deceit ; and this latter vice in our opinion more than counterbalances their other good qualities. With this deceit they have much plausibility and apparent frankness. They come in open day looking innocent enough, but at the same time with a lie in their right hand. They require much to be done for them, they will rarely make one real sacrifice in return. A Karen will work cheerfully with you as long as it is in his way of thinking ; but cross his path in the slightest degree and a more intractable man does not exist. He will rarely show overt opposition. Sullenness and passive resistance are his weapons—seldom, if ever, is he a principal, invariably an accessory As a race they are destitute of animal courage; they are afraid of things visible and invisible, of a real bodily foe and an imaginary spiritual one. Amongst other crude ideas once started for the benefit of our Burmese Provinces, was that of raising one or more Battalions of Karens ; a more delusive project never was entertained. No amount of pay would tempt a Karen to become a soldier, to absent himself from his native village, or to rush headlong into danger. We cannot help raising a smile on hearing this plan every now and then adverted, when we know it as an undeniable fact that a dozen armed Karennees or Shans would march from one end of the Yoon-tha-lin to the other, unmolested and unoppos-

ed by the Karens. As far as the writer understands the Karen character, what they wish for is this, that they should remain unvisited in their mountain homes by any one, go where they like and pay no tax. Frequently has the writer in conversing with more civilized Karens, meaning thereby those who mix with their fellow-men of other races, asked them, what could have been the motive why their countrymen have acted in so deceitful or so tortuous a manner, the reply invariably has been "Why! He is a Karen": volumes of vituperation could not have said a bitterer thing than this reflection implies.

We have been thus particular in attempting to delineate the leading features of Karen character, inasmuch as a mistaken notion has got abroad regarding it. The prevailing idea is that the Karen is a fine, open-hearted, manly mountaineer, hitherto oppressed by other races, but burning to be free, ready to embrace Christianity, and awaiting with a throbbing heart the advent of a Christian teacher. We have no hesitation in saying that we place very little reliance on the accuracy of this pleasing picture. Far be it from us to disparage in any way the noble work of the American Baptist Missionaries, who are and have been labouring amongst these benighted heathens. They are worthy of all honour; their opinion is entitled to every respect; but the wholesale assumption of Christianty which has been attributed to whole tribes of Karens, involving as it does no real sacrifice on their part, should be received with caution; and until it produces some substantial fruit, the writer will be at least doubtful of its vitality.

The Missionary movement has taken place in the Toung-oo district principally; hitherto little or nothing has been attempted amongst the Sgau Karens of the Yoon-tha-lin. It may perhaps therefore be argued that the writer is passing judgment on a state of things which has not come under his immediate observation, and that what may hold good with the Yoon-tha-lin need not apply elsewhere. To a certain extent this is true. But that his view is not altogether erroneous may be gathered from the following instances—Let any man, see an English Officer travelling about, go to any Karen village either in Pegu or the Toung-oo district and he will be received with an amount of churlishness and direct insolence that he will not forget in a hurry, and this too amongst

what are called Christian Karens. No one who has been placed in such a position but will immediately recognize the justice of the illustration. The fact is, the visit is a bore to the Karen, it requires some little sacrifice on his part, and this sacrifice he will not make. On the other hand the *heathen* Burman or Taleing will always receive a stranger with courtesy and hospitality.

Be the sincerity of the present movement what it may, it is still our duty to persevere : if we cannot make Christians of them, we shall probably humanise them to some extent, and that will be a substantial gain. In all likelihood the best agency to be employed for their improvement, will be that of educated Karens, not every one a man who has been brought up in a Missionary school, but men of shrewdness and respectability, men whose social standing will carry some weight.

We will conclude this article, which has already been spun out to an inconvenient length, with a few remarks on the population and productions of the country and the policy which ought to be adopted towards the independent tribes beyond our frontier.

No correct returns of population exist, but it is surmised that the Yoon-tha-lin Karens number about 20,000 souls.

The staple articles of produce are rice and betel nut. A good deal of cotton is also raised. Teak and other good timbers abound. With regard to minerals, iron and lead are often met with ; but the localities are remote and difficult of access. Beyond our frontier, there is an excellent tin mine, so much so that it gives its name to a river, the " Kai-Ma-Pyoo" or Tin river. But it is very doubtful whether any of these metal will be worked in our times ; the population is too scanty, the position too remote and the climate too unhealthy.

It is not likely that we shall extend our N. E. frontier beyond its present limits ; we have nothing to gain by annexing vast regions of jungle thinly inhabited by savages.

But on the other hand a vigilant and firm policy should be exercised towards there petty independent tribes. Every insult should be avenged, and every wrong committed against our subjects redressed ; by such means alone can we insure safety to life and property. We must make our name feared by those people,

Letter writing and remonstrance are utterly useless ; whenever it is necessary, a compact expedition should be sent to chastise these marauders, and when punishment has once been inflicted, like all other Asiatics, they will crouch. Already has the unsafe state of our N. E. frontier entirely destroyed the trade which a few years ago existed, and has checked to a considerable extent the commercial dealings which the Shan people carry on with our possessions. The route through the Karennee territory and Shooay Kying has been completely abandoned, and the more circuitous one viâ Toung-oo has been adopted. This trade is capable of great expansion ; and if the road was made tolerably safe, a very large amount of British manufactures would find its way into the country of these Indo-Chinese nations. This debateable land lies between our frontier and the Burmese Shan country. The Burmese Shans are a shrewd, intelligent, industrious people, excellent cultivators and sharp traders ; and any extensive immigration of this race into our possessions would be a real benefit, a gain far greater than is ever likely to be realised from any indefinite number of Karens.

The firm and vigilant policy which we have recommended, is the more necessary as the French occupation of the river Cambodia is extremely likely to draw towards its basin that increasing commerce which under the natural conditions, and with our advantages of position and power, would chiefly benefit our manufactures.

It is impossible to repeat too often that there is one influence every Asiatic understands and obeys, from the Dardanelles to Japan and that is *fear*,—the fear of a stronger power. We lose sight very frequently of this simple fact, and attempt to deal with the oriental world as we do with the world of western Europe.

In the foregoing pages we have accidentally omitted to say anything regarding the taxation of the Yoon-tha-lin Karens. This is light enough, a capitation tax of 1 Rupee per annum on each single person, of 2 Rupees on each family man, and a land tax of 1 Rupee per each " Da" or wood knife, are levied. Beyond this they contribute nothing. Each *Tsaukay* collects the tax on his own individual village, and makes it over to the *Thoo Kyee* or revenue collector of the district. In the judicial department the

more petty matters are settled by the Head Executive Official called the "Koung Gyouk." All other cases, not involving death, transportation, or lengthened imprisonment, are disposed of by the Assistant Commissioner.

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VII.—*On the supposed fixity of the Poles.* By the REVEREND W. TAYLOR.

This paper is not a captious, or pretending effort, finding fault; but it is, at least, intended to be a modest appeal to the Baconian principle of Science, against hypothesis; even though backed by a great name. Sir Isaac Newton was great when he demonstrated: when he theorized, he was as other men. A specimen of the latter may be taken from his theory on first formations; according to his exponent, the late Granville Penn, Esq. With such persons as maintained the spontaneous formation of existing things—of course not weakening the statement that God formed the trees with their seed within themselves—it would have been sufficient to urge the impossibility of an infinite series. Some Being must necessarily exist from eternity; and from that Being all other beings must be deduced: to maintain that the earth is self-existent is the same as to assert that it is God, which is absurd. Instead of this simple way of proceeding, Sir Isaac Newton theorized on first formations; and not only so, but also on the modus operandi. The doing so weakened his position. We may respect his high toned piety; but his logic was not of the best.

As regards the form of the earth, Newton demonstrated that it is an oblate spheroid, giving the ratio of the two axes; and he compared the spheroidal form of other planets. The measurement of two arcs, one near the equator, and one near the north pole, confirmed that result. The measurement was made by order of Louis 15th of France. But then Newton theorized hastily, as I conceive, when asserting the fixity of the polar places; because the earth is of the spheroidal form. Whiston, who had thought the polar points moveable, yielded to the authority of Sir Isaac Newton. I presume to think that he was wrong in so doing.

Dr. Bradley, Astronomer Royal, instituted experiments on this point, connected with his own discovery of the nutation of the earth's axis. As a practical man, he had the very best possible instrument made, and fastened to a wall. With this first-rate instrument he patiently carried on a series of observation, for twenty years ; and, at the end, found a small difference between the polar place at the beginning, and at the end of his observations. As the difference was small, he placed it to the account of the instrument; affording another instance that a mathematical mind is not always logical. Had it been otherwise he must have formed an opposite conclusion. Let the difference* be 2'' in 20 years, then $2 \times 30 = 1' \times 60 = 1^{\circ}$ and $20 \times 30 \times 60 = 36{,}000$ years. That rate of motion, in 36,000 years, would give a degree, or 60 geographical miles. Take $\frac{1}{6}$ or 6,000, and then 10' or miles is the motion in 6,000 years : too much to be ascribed merely to error ; and in a nearly perfect instrument.

This indication is confirmed by geology ; for instance a fossil elephant dug up in Siberia, and petrifactions termed hamites found in Europe. Now these hamites are neither more nor less, than the scaly coating of a kind of millepêde found in profusion in gardens at Madras, which eat the germ of kitchen herbs, and leave the said scaly coated exuviae every where around. In the Arctic expedition, which first entered Lancaster's Sound, Captain Sabine noted that the limestone rocks were composed of shells of the Venus kind. This shell is tropical : it abounds on the Madras beach ; is found in the water that surrounds the Island ; and is brought, in barges on the Canal, from Pulicat and other places. The earth certainly has turned by a different motion from its diurnal arc ; latitudes, zones, and climates have shifted ; and the polar places cannot be fixed.

The motion being very slow, there are efficient means, incessantly acting, to restore the earth's spheroidal form. The ocean al-

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* On enquiring for Vince's Astronomy at the Library of the Madras Literary Society, I learnt that the work had been sold. The greatest nutation is 18'' during nine years : it then recedes, and becomes small. I do not recollect the exact figure : it suffices that the same is measurable.

ways protrudes at the equator ; and that ocean brings with it deposit matter from great rivers, such as the Ganges, the Orinoco, and the like. In Fairholme's Geology of Scripture are contained notices of the most remarkable instances of speedy formation of limestone rocks, under water. There is a connected circumstance on which I rest weight. A cocoa-nut tree inclined was found, embedded in limestone, in a high northern latitude. The cocoa-nut tree is never uprooted ; but, in unprotected exposure to a hurricane, it bends. I have seen such trees at from 70° to 20° of inclination. This instance sets aside objections from diluvial floating. The tree was found where it had grown ; and the cocoa-nut tree is only met with between the tropics.

By two observations of the star Spica Virginis, at very distant intervals, the precession of the equinoxes was discovered. Though this discovery was clearly proved ; yet, strange to say, the Sorbonne at Paris contested the point, and would not admit the fact, until driven to do so. Harvey's discovery of the circulation of the blood was, for a long time, opposed by two cotemporary Physicians. The human mind, with reluctance, admits a new idea ; and there are not many persons who think, and reason for themselves.

On the foregoing data I submit to the consideration of Astronomers, and of Philosophers in general, the expediency of looking further, and looking well into the Newtonian dictum of the fixity of the poles. Allow a man to be great when he truly is so : do not deny him to be weak, or at least on one point ; for every man is so. As a theologian I have nothing to do with Newton's demonstrations, but implicitly to receive them. As a mathematician, Newton was out of his place, when he became a commentator on the book of Revelation. Voltaire, his ardent admirer, wrote as much ; and I believe he therein wrote truly.

I think the Newtonian terms centripetal, and centrifugal, would admit a better nomenclature. This however, is not my present object. Electricity, galvanism, and magnetism, with their laws were unknown in the time of Newton. Let him have all applause for the best possible terms then ; but let Faraday, and others, see to an improved nomenclature now.

Dr. Bradley had discovered the nutation of the earth's axis :

but was, for sometime, at a loss to account for it; till sailing one day, in his pleasure boat, on the Thames, near Greenwich, he observed that the dog-vane did not immediately obey the wind, on tacking, but came round slowly. That, to his mind, explained the nutation of the poles. And thus he gave a specimen of his powers of ratiocination. For the analogy to hold good, the earth ought to tack like a ship, with Commodore Trunnion for a pilot. Another analogy, by Dr. Bradley, was derived from a spinning top; which yaws, or, in boy's language, wabbles while it spins on its peg. But then the top has nothing near it, to affect its motion. Not so the earth; since, apart from the attraction of the sun, it is strongly influenced by the moon; and the satellite has its librations. When it exceeds, by a wee bit, on the south or north, its customary longe, the pole, on either side, respectively, feels a tug, and there is no recoil: it remains at a minute, that is calculable distance, from its former place. The constant recurrence of the pulls gradually effects a change in the places of the poles, of the arctic and antarctic circles; and also of the equator, and of the zone-climates: explaining various geological phenomena, not otherwise explainable. To my own mind, the case appears so clear and simple, that I can only wonder there ever was any difference about it.

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## VIII.—*Contributions to the Botany of Southern India.* By LIEUT. R. H. BEDDOME, *Assistant Conservator of Forests.*

### No. I.

### EUPHORBIACEÆ.

TETRAGLOSSA, new genus, (near Trewia.)

Gen: Char: Diæcious. Male calyx 2—3-parted, corol, 0. stamens numerous, anthers forming a globular head, 2-celled, dehiscing transversely—rudiment of ovary, 0. Female calyx 5-parted, segments acute, tightly clasping the ovary—corol, 0. style thick, stigmas 2, deeply 2-parted, and very papillose on the inner surface, ovary 3 or by abortion 2-celled, cells 1-seeded. Capsule 2—3-celled, cells 1-seeded, Embryo inverse in copious albumen.

*Tetraglossa Indica*, Arboreous, leaves glabrous, shining, oblong

to obovate with a short blunt acumination, serrated 4—6 inch long, 2—3 inch broad, petioles 2—3 inch long—male racemes axillary from nearly as long to longer than the leaves, many flowered pedicels 3—4, from small convex bracts at interrupted distances along the raceme. Female, peduncles 1-flowered axillary, as long or longer than the petioles, with 2—3 small bracts along their sulcated surface. Capsule generally 2-lobed, cocci very hard.

Anamallay hills in moist woods 2—3000 feet, a good sized tree, wood very hard and close grained.

## ANTIDESMEÆ.

### Laneasagum, (new genus.)

Gen : Char : Diæcious. Male calyx 5 sepaled in a double series imbricated, fusco-pubescent on the outside, within lined with a thick fleshy hairy disk—stamens very numerous in several rows on the outside of the disk—anthers 2-celled, bursting longitudinally, introrse, rudiment of an ovary 0, or rarely present. Female calyx as in the male ovary sessile very downy crowned with a large sessile 2-lobed stigma, lobes again 2-lobed and jagged on the margin, no rudiment of stamens—ovary 2-celled with 2 pendulous ovules in each cell. Drupe densely covered with woolly hair, crowned with the stigma, 2-celled, cells 1-seeded, seed suspended, cotyledons very large, foliaceous, cordate with a rounded apex, lying in copious fleshy albumen, radicle long for the order.

*Laneasagum oblongifolium*, a middling sized spreading tree, leaves oblong with a short sudden acumination, entire glabrous, pale beneath; very shortly petioled, ramuli and petioles fusco-pubescent, stipules nearly the length of the petioles, one on each side, caducous, flowers sessile on knobs on the branches, females sometimes axillary, solitary. Drupe more than ½ the size of a walnut.

Abundant in most woods on the Anamallays at from 2 to 3000 feet, called " *Walle*" by the hill tribes.

## ANONACEÆ.

### Orophea.

*O : erythrocarpa.* Leaves elliptic 2½—3½ inch long by 1—2 inch broad, acuminated, slightly pubescent when young, at length

glabrous above, peduncles axillary or above the axils, pubescent, longer than the petioles 3—4 folded pedicels pubescent long, calyx and petals pubescent—stamens 12 in a double series, lower series sterile, ovaries 6, densely strigose, 2 ovuled. Carpels oblong red. seed solitary, large, scrobiculate.

A middling sized tree, very abundant in moist woods on the Anamallays, up to 3000 feet, associated with " Cyathocalyx Zeylanicus" (Champion) and " Unona pannosa" (Dalzell), the last mentioned is perhaps the most common of this order here, it is called " *Chen nàree*" by the hill tribes, and its fibre is much used.

*O: Thomsonii.* Leaves ovate elliptic $1\frac{1}{2}$—2 inch long by 1—$1\frac{1}{4}$ broad, glabrous with a longish blunt acumination, sepals and outer petals strigosely hairy, inner petals with a long narrow claw slightly pubescent especially on the inner surface—stamens 10—12 in a double series, ovaries 5—6 hairy 2-ovuled, peduncles axillary 3-flowered strigosely hairy—peduncles and pedicels very short, carpels size of a pea, globose.

A small tree, Anamallay hills with the preceding, the flowers are smaller than those of *O: uniflora ;* (H. f. et T.) an allied species which I have found in the Wynaud though I have not detected it on the Anamallays.

## BEGONIACEÆ.

### BEGONIA.

*Begonia reniformis*, stemless, root tuberous, leaves very obliquely reniform, repand, or slightly lobed, long petioled, densely floscose when young, at length glabrous, shining above, beautifully frosted below, stipules large scariose, scapes generally much longer than the leaves, cymes dichotomously branched, many flowered *perianth of both sexes 2-petaled*, flowers small.

Anamallay hills, on banks of streams in most woods 3000 feet, very rare, a beautiful plant.

## RUBIACEÆ.

### OPHIORHIZA.

*Ophiorhiza falcata.* Suffruticose, erect, every where glabrous, leaves lanceolate, tapering at both ends, acuminate, very pale beneath, stipules large subulate to triangular, cymes axillary and ter-

minal long peduncled with about 3 reflexed secund divisions, 2 of which are generally 2-parted *bracts large falcate*, calyx minute, flower buds angled, corol gibbous at the base and contracted below the segments, glabrous outside, hairy in the jaws above the anthers.

Anamallay hills, in sholas 3 4000 feet growing with O : Roxburghiana (Wight.)

## LABIATÆ.

### Coleus.

*Coleus Anamallayensis*, herbaceous, stem erect, glabrous 4-sided leaves elliptic, serrated from near the base, petioled, covered with minute asperities, racemes terminal, verticillasters with 2 reflexed small bracts at the base 6-flowered—pedicels, calyx, and corol minutely pilose, tube of the corol 2½ times longer than the calyx, glabrous within—upper lip 3-lobed, middle lobe emarginate, lower lip cymbiform entire narrow and longer than the upper one, filaments 3—4 times longer than the corol, (the inferior longest) in œstivation rolled up—style a little longer than the filaments.

A very pretty annual, moist places in the Teak forests of the Anamallays, in flower June and July.

## AURANTIACEÆ.

### Cookia.

*Cookia ? dulcis*, a small tree, leaflets 7—9 pairs, obliquely ovate, unequal sided, ending in a longish blunt acumination, punctated, margin waved, ciliated with minute tufts of hair—peduncles, petioles, and nerves of the leaves slightly scabrous, panicles a little above the axils shorter than the leaves, bracts of the lower branches of the panicle pinnate, conform to the leaves, but small petals 4, stamens 8, fruit globose, size of a large cherry.

Calyx 4-toothed, petals 4, flower buds angled—stamens 8 distinct *filaments* subulate above and attached to the middle of the anthers *dilated below* (as in "Clausena") *ovary sessile* (no torus) *glands of the ovary without hairs*, 4-celled ovules 2, superposed in each cell, style 4-angled, thick, (as if 4 styles were consolidated into one) stigma 4-lobed. Fruit globose, filled with balsamic fluid, covered with a thin rind (whitish) punctated with pellucid dots 1—4 celled 1—4 seeded, seeds covered with a thin white testa, cotyledons glabrous, radicle covered with fuscous stellate tufts of hair.

I have added this detailed description as this differs slightly from the generic character as hitherto given, the difference however I do not think sufficient to constitute it a new genus.

A tree with a delicious fruit not uncommon on the Anamallays up to 3000 feet both in the moist woods and in the drier forests—it flowers in April and the fruit begins to ripen at the end of June—the fruit is more grateful to the taste than that of the Whampee (Cookia punctata). The tree is well known to the hill tribes and called "Mor Koorangee." I have often met Kaders carrying home on their backs basket loads of this and the fruit of "Pieraxdia Sapida" which is also abundant in these jungles.

## MELASTOMACEÆ.

### ONERILA.

*Sonerila rotundifolia*, herbaceous, bulbous—leaves radical very long petioled—rotund, base cordate with the lobes overlapping, 7-nerved nerves very prominent beneath, red. glabrous and rather succulent—scapes longer than the leaves with 3—6 secund flowers at the apex—pedicels short thick, flowers rather large, petals obovate retuse—flowers pink.

Anamallay hills, moist rocky places 4—5000 feet.

## AMPELIDEÆ.

### CISSUS,

*Cissus dealbata*, glabrous shining, stems quite white with a mealy bloom, *obsoletely angled* leaves cordate shining, base deeply cordate, acuminated with a short mucro. red. bristle-toothed from shallow serratures—petioles about ⅔rds the length of the leaves—stipules broad truncated, at length reflexed, cymes leaf opposed, peduncles generally shorter than the petioles, pedicels about 5 simply umbelliferous or again divided, *tendrils bifid* always present on the young shoots—fructiferous pedicels much reflexed.

A specious looking plant with its deep green shining leaves and red bristle teeth, and tendrils, it is allied to "C. glauca" (Roxb.) but is I think quite distinct—it is common about the Anamallay forest, together with "C. discolor" (Dalzell) of this latter plant. Mr. Dalzell when describing it says "foliis supra intense viridi-

bus," the leaves here are most beautifully clouded above with large white patches, they are however undoubtedly the same plant, and I think that I have seen the same species in gardens at Calcutta as brought from Java.

*Cissus gigantea*, stem often 5 inches in diameter, bark very corky, young shoots glabrous terete, leaves exactly cordate with a deep sinus at the base, acuminated and with a mucro. 6—8 inch long by 5—6 broad glabrous above, tormentose beneath, crenated with a sharp tooth in each crenature (young leaves sharply and unequally serrated) 5-nerved and much reticulated—petiols $\frac{1}{2}$ to $\frac{2}{3}$rds. the length of the leaves tendrils (abundant on the young shoots) 2-cleft, large glandular knobs as stipules, peduncles shorter than the petioles, cymes compound with 3—5 primary divisions, divisions simply umbellate or again divided into 2—3 umbels—flowers very small green petals distinct, style half the length of the filaments, fruit small 1-seeded.

Anamallay forests in moist woods 2,000 feet—mounting to the tops of the highest trees.

*Cissus suberecta*, erect or sub scandent *every where glabrous except the slightly scabrous pedicels* of the cymes—*stems* angled very glaucous and dotted—petioles $\frac{1}{2}$ shorter than the leaves, leaves broad cordate to repand, or often slightly 3-lobed towards the apex, sinus at the base very broad, acute at the apex, incurved bristly-serrate, as broad or broader than long, as much as 8—9 inches each way, 5-nerved, much reticulated : stipules oblong broader at the apex early caducous peduncles shorter than the petioles, cymes with 3—4 primary divisions—divisions umbellate or again divided—flowers purplish, style short, tendrils only present on very young shoots simple or rarely bifid, fructiferous pedicels much thickened, fruit purplish larger than a pea.

Anamallay forests—rocky slopes 2000 feet, generally in the form of an erect shrub.

I may here mention that I sometime find the flowers of "Vitis latifolia" with 4 petals and 4 stamens as in Cissus.

*(To be continued)*

## IX.—*Notes on Zanguebar.* By M. Edouard Loarer.

The Island of Zanguebar, situated about 20 miles to the Eastward of the Coast of Africa between the 5th and 7th degrees of South latitude, like all intertropical countries in the Indian Ocean, is visited by the monsoons. The commencement of the north monsoon is uncertain, but it may be said to begin between the 1st of November and the 1st of January, and to blow during a variable period, but never for more than seven or less than five months. The south monsoon begins between the 1st of April and the 15th of May; it sets in always more decidedly and without previous warning, and blows generally for a longer period and with greater force than the north monsoon. I must add that it is very difficult, not to say impossible, notwithstanding the theories which have been advanced, to establish fixed rates for the monsoons, it frequently happens that southerly breezes prevail on that-part of the Coast of Africa, during nearly the whole of the northern monsoon. It may however be remarked in general that in that latitude and more to the southward the southern winds prevail during seven or eight months every year, and the more the navigator proceeds to the South the more he will encounter southerly winds, so that near the tropic of Capricorn, the north winds do not last more than three and a half or four months, viz. from December to March. During the interval of transition from one monsoon to another calms and light variable breezes prevail, and near the land, the breeze during that period, will regularly be found to make one complete round of the compass. This interval of light and variable winds lasts in some years as long as two months. Between each change of the monsoon this is a precious period for the Arab Dows, which eagerly profit by the opportunity to make a number of trips up and down the Coast.

During the eight or ten months of strong breezes a very rapid current sets in a few days after the change and runs with the wind. December, January, February and March are the months when strong northerly winds and currents are experienced. May, June, July, August and September are the months more subject to heavy southerly gales and currents. During these months a ship bound to any port of the Coast of Africa should be very careful to make

the land much to windward of the place he is steering for; and if he does not know the Coast, the Captain must be very cautious. A ship bound to Zanguebar during the north monsoon, if coming from the north should make the land at or near Mombana and thence follow the channel between Pemba and the Coast of Africa; if coming from the south and she tack to windward of the northern point of Zanguebar, she must port and pass to leeward, rounding point Kizimkazi the southernmost end of Zanguebar, and then luff and tack all the way to the town of Zanguebar. The channel between the Island and the Continent of Africa, is safe and deep, and there is no danger that cannot be seen from the foreyard.

In no circumstances whatever should a ship which has fallen to leeward of the windward end of the Island, try to beat against the wind and current in the open sea. No sailing ship however swift will succeed in making progress against a very heavy sea and a current of four or five miles: it is not only better but indispensable to make the passage to leeward, and as soon as a ship is in the channel she will find very smooth water and regular changes of currents with the change of tide twice in the twenty-four hours. As soon as the breeze or current fails to favor the ship, she may touch every where. It is not prudent to sail during the night.

A ship coming from the south during the south monsoon, will make the land Moussia, round the north point of that Island and should then steer due west to reconnoitre the Coast of Africa. By so doing she will leave the dangerous shoal of Latham* about 20

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* Latham Latitude 6° 54' 2" Longitude 39° 55' 5". In Captain W. F. W. Owen's Survey of 1824, the position of Latham is not given correctly; there is a difference in Longitude of nearly 12 miles; Latham is 12 minutes more to the Eastward. This is not a partial error, all the Eastern Coast of Africa and the Western and Eastern Coast of Madagascar are put too much Westwards, of a quantity varying between 12 and 15 minutes in Captain Owen's Survey. Was this owing to an incorrect point of departure when that distinguished Officer began his Survey, or to some defects in his Chronometers? It is difficult to say, but the fact has been proved beyond doubt by the Surveys made by the Officers of the Bourbon Squadron under orders of Captain now Admiral Romain Desfosses, from 1844 to 1847, though, not having the Charts of that new Survey, I can speak but approximately.

miles to the north and make the land at point Poonah. By steering that course, the ship will not be influenced by the strong current which runs from Moussia to Zanguebar, she will not lose sight of the land, even during a very dark night, and she will be in a position to anchor any where between Poonah and the southern end of Zanguebar, as soon as she reaches soundings of from 10 to 12 fathoms.

Latham Island and reef lie due south from the southernmost end of Zanguebar: it is a very dangerous place, the highest spot on the Island is not six feet above the level of the sea, it is surrounded by a coral reef with very shallow water for nearly two miles round the centre of the Island.

There are not less than 50 fathoms of water at a cable's length from the reef, so that during the night soundings could not be of any use—the noise of the breakers is the only warning of the approach of this dangerous reef—the currents are always very violent near Latham, and on approaching Zanguebar for the first time, ships must so shape their course as to get clear of that danger before the night.

When passing two miles and half to leeward of Latham, we could smell the ground, and the ship was surrounded by clouds of birds. In 1846 Mr. Peters, agent to the London firm of Coghen and Co., had a hut built on the Island of Latham for affording shelter to a few fishermen who were engaged in collecting the guano on the reef; the same fishermen were employed in fishing for sharks whose flesh and liver find a ready sale at Gunsebar, while the fins are prepared and sent to Bombay and thence to China. In February 1847 a very violent sea (raz de marée) washed over the Island and carried away huts, fishermen and guano.

In 1848 Mr. Peters died, and since that time nobody has attempted to land at Latham; the current report in 1849 was that there was a large deposit of guano on the Island, but it is not improbable that this may have been originated by some designing Arab to attract European speculators.

Point Poonah is a moderately elevated land, covered with trees, amongst which the cocoanut predominates, and far in the interior is observed a range of high mountains, or rather hills, covered

with large trees. During a clear star light night Point Poonah from a distance of six miles may be easily seen soon enough to avoid accidents. The water is deep very close in shore and there is no shoal or rock jutting outside.

The southern end of Zanguebar is very flat and low, and the heads of the cocoanut trees appear on the horizon, sometime before any land is to be seen. The channel between the Coast of Africa and the Island of the Zanguebar is broad and safe—the water is every where clear and transparent; and an intelligent man at the lookout will easily see the dangers in time to avoid them, in case the ship be keeping a bad course. There are a number of small rocky Islands along the western Coast of Zanguebar which must all be left to the eastward; and on coming abreast of the islet of Shomby the town of Zanguebar is discovered. To the south of the town and far from any other building is an elegant little Mosque belonging to the Indian Mussulmans, Shiahs or followers of Ali, it is situated exactly on the spot marked on the map of Captain Owen, as "the ruins of a Mosque." In the eastern part of the town, towering above all the surrounding buildings, there is a Minaret, the only one in the town, in the shape of an elongated sugar loaf. When the Minaret is observed to be exactly over the Mosque of Captain Owen, the ship must steer upon these marks and keep them in line until at three cables' length from shore, then rounding parallel to the shore, she will pass the point Shingony and enter the harbour, where good anchorage is every where to be had, the spots preferred being opposite the English and American Consulates.

In 1849 the Imam had a buoy placed on each side of the north and south channel leading into the harbour, so that the difficulty in making the anchorage has been lessened. There are no pilots at Zanguebar, but should any ship feel diffident of coming in without such assistance she may by carrying to obtain the services of experienced Arabs. The harbour is formed by a chain of reefs and small islets covered with cocoanut trees, and there are a few white houses to the westward of the town. There is deep water between each islet, so that a ship of any size might with fair wind take either of these passages, though some care and knowledge of the locality are required. Ships of war go generally a little

further up and anchor opposite the palace of the Imam, at two cables' length fromt he Flag Staff where the Arab flag is easily distinguished. Ships always ride at two anchors, moored north and south.

The spring tides run very strong, and during the north monsoon, from December to April, there are heavy squalls from the westward. The tide rises and falls 12 feet ; and as there are a number of flat and firm shoals, well adapted to facilitate repairing and cleaning, small ships may turn this to advantage.

The town of Zanguebar seen from the anchorage, has a very fine appearance. The shore is lined with a row of buildings, if not elegant, at least large and well kept ; and since 1847 two larger houses have been erected, which for the exquisite Arabian taste displayed in ornamenting them, rather deserve the names of palaces. At the first sight the new comer is agreeably surprised, but let him walk in the interior and his illusions will very soon be dispelled. That screen of stately white houses with green or lackered venetians conceals a heap of ruins and huts half buried in a labyrinth of narrow and crooked lanes, defiled with heaps of all sorts of animal and vegetable matter in a state of decomposition.

The Imam Seyed Said, when he is in town, lives in a long row of buildings standing on the sea shore and having much of the appearance of a dilapidated barrack or prison. Strong iron gratings protect the windows, and behind the bars are immured the numerous 'Serayes' of the Sultan. Seyed Said is in town every week when in good health from Thursday morning until Sunday night : every Monday morning he repairs to his other residence called M'tony (a Somauly word meaning 'rivulet') situated some six miles to the north of the town, in the centre of a beautiful grove of mango, cocoanut, and orange trees, and irrigated by a rivulet, the only one in the whole Island, which never runs dry even in the hottest season.

To M'tony ships send for their supply of fresh water, the Imam having erected a small pier and an aqueduct for the accommodation of boats. But though the water looks very pure, and has not any particular taste, it is a fact that all men of war, French and English,

which have taken water at M'tony, have been visited after leaving Zanguebar with a very severe epidemic form of dysentery. The merchant ships never resort to M'tony for water, finding it more convenient to bring it from the wells which supply the population of the town.

During his stay in town, the Imam sits twice a day for some hours in a large room on the ground-flour of his Palace to afford an opportunity to those who may desire an audience ; in this reception room he transacts all his private and public business, and decides difficult cases, Judicial and Police.

I have many times seen the Imam while listening to his Secretaries, reading important letters relating to political matters, and dictating to some Secretaries in his Durbar letters of no less importance, in presence of hundreds of Arabs standing in a double row all round the reception room. I have even heard some of the bystanders volunteer an explanation, when the Imam, being in doubt about some fact, was consulting with his son Seyed Kaled and the titular Governor Said Suliman Ben Hamed ; and the intruder was always kindly heard, and his opinion received or quietly discussed by the Imam, and in spite of such apparent familiarity the Imam is both respected and feared. When some facts are not sufficiently clear or require more investigation, he sends the parties either before his son Seyed Kalid, who presides over the Supreme Court, or before the Governor Said Suliman Ben Hamed, who is Minister of Justice. Said Suliman Ben Hamed—or to speak more correctly Suliman Ben Hamed, because he has no right to the princely title of Said—is of low and poor extraction, and followed during his youth at Muscat, the humble occupation of a tailor; but he is a man of great ability and knowledge of his countrymen ; as a judge he is harsh and cruel, and will order the most atrocious torture with a gentle smile on his face. He is perhaps the most deficient in courage of all the subjects of the Imam, and I have heard of many instances where he proved in practice the principle that discretion is the better part of valor. He is very liberal-minded towards strangers and when he takes a fancy to a European admits him into his full confidence. Said Suliman is the best farmer in Zanguebar, and the cloves of his plantations fetch always the

highest prices in the market. Were it not for his continual sweet smile, the qualities displayed by this erect and fair-looking old man, his adroitness in steering through tempests of conflicting interests, his unscrupulousness, his cool and pitiless severity, his affectation of piety and superstitious fear of astrologers, his want of bravery and inveterate hatred, never forgiving an offence, his success in warfare, where though often beaten, he has always reaped the fruits of victory, suggest to the student of history, the character of Louis XI. so admirably depicted by Sir Walter Scott, in Quentin Durward.

Under these two high judicial functionaries there is a number of Cazees, but very rarely will the inhabitants of Zanguebar have any thing to do with them, unless to give legal sanction and force to some deed of sale or other, by having it drawn up by the Cazee or in his presence : the Cazee's powers do not exceed those of a subordinate Police Officer in one sense and a notary in the other.

All the time that Seyed Said can spare from his public duties, he spends in the interior of his harem, and he is said to be a fond parent. It is generally supposed that Seyed Said's Seraglio is adorned with about a hundred 'Serayes,'* one-half of that number being in town and the remnant at M'tony. In 1847 he married a young Persian lady, said by some to be a Princess, by others a lady of noble descent. It was my good fortune to see the Princess in March 1854 riding a beautiful Arab horse, and I am bound to say that no lady could sit more cavalier-like on horseback *en califourchon.* Seyed Said has about forty children of all hues, but all are children of Serayes, he never had any legitimate child, though he has been married for the last forty years to one of his cousins who is yet living. The Imam was in the habit of drawing every year from Manonah five or six young and fair Abyssinian girls to replenish his harem. But in 1847 and 1848 some English cruisers resting on the treaties existing between his Highness and Great Britain for the suppression of the Slave trade by Arab vessels to

* Seraye is the Arabic denomination of all females not legitimately married, whence the Europeans, mistaking *the 'contenant' for the 'contenu,'* have probably made Seraglio, Serail, a word of no signification. Harem is the word for the house where the women live.

the north of the equator, seized two dows carrying fair freight for the Imam, and landed the long-eyed Abyssinians at Aden where I believe they have settled very comfortably.

Seyed Said was much shocked at these proceedings of his good friends the English and since that time, to avoid the cruisers, the poor girls are conveyed overland from Manonah to Bravah, thence to Samoo, which lies to the south of the equator and are carried from Samoo, *coram populo*, to Zanguebar. This transit only enhances the price of the article, and the Imam does not care for a few paltry dollars more or less. Commercially speaking the loss sustained in bringing them, from Manonah to Samoo overland (1,500 miles) is about fifty per cent; but the Imam could not understand that the laws he had consented to for his subjects were to be so soon applied to himself, and with such unrelenting vigour.

This fact is very instructive and significant. All attempts at suppressing the Slave trade have invariably resulted in aggravating the fate of the poor victims of cupidity, and the armaments of England have produced this result to an extent known only to men who have been witnesses of all the phases of that antichristian trade. Many illustrations of this opinion will be found in the course of the present notes; and I have always been of opinion that the efforts made for the repression of the Slave trade cause more atrocities than are compensated for by the benefits attending them; and if an end is to be put to that infamous traffic, the Slave holders must be induced to free their Negroes. A continual demand will ensure a supply whatever be the risks. On the day that there is no more demand, the trade will fall of itself. The best way perhaps of securing the abolition of slavery at Cuba would be to land a hundred thousand Negroes there at once.

The old Imam spends every year large sums of money increasing his museum of houris. He has also another way of spending money not much more profitable; being very fond of ship building, every year he adds two or three ships to his fleet lying at anchor opposite M'tony. In 1849 he had a dozen of these ships of war in the roads of Zanguebar; they are built at Cochin, and from my personal experience of the sailing qualities of two of the finest of the Imam's ships, they do not appear to be of the very

best construction. One of these frigates* bound to London, on her first voyage lost her rudder on the fifth day after leaving Zanguebar. When sailing with a fine smart breeze under starboard studding sails, the rudder went off very quietly, all the hinges having given way without noise or shock ; and in consequence of that loss, the three masts went overboard five or six hours afterwards. She was with great difficulty brought to Simon's Bay with jury-masts and rudder ; and on being refitted at Table Bay sailed for England ; but on her voyage she foundered at sea and was no more heard of. Another of his ships† sent to London arrived at *New York* after five months of terrible toil ; this was not owing to deficiency in navigation, as the ship had two English sailing masters of well known ability, but was wholly attributable to the bad sailing qualities of the ship. The ships constructed at Cochin are of teak, iron fastened, with teak masts and coir rigging, not an inch of hemp rope being used either for running or standing rigging. Added to that as the hulk is always constructed on some bad plan, it is not to be wondered at if they are such dangerous tubs.

When the Imam intends to have a ship built, he always commissions one of his favorite Nakoodahs to superintend the work : to that Nakoodah the money is entrusted, and he makes his own bargain with the builder,—the only order given by the Imam to the Nakoodah being to have a ship of so many feet of keel put on the stocks. He then receives a sufficient credit on the Imam's Agents at Bombay, and he is allowed an absolute liberty of management; the consequence of which is that the Nakoodah gives the preference to the most unscrupulous builder, and a commission of this sort generally ends in the Nakoodah making a little fortune, "*out of the shavings*," to use a favorite phrase of the Arabs of Zanguebar.

The Imam knows all this, and does not mind ; he pays like a gentleman and without a grumble. The Nakoodah comes back to

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* Named *L'Artemise* in compliment to Admiral Laplace, who had visited Zanguebar in a French frigate of that name, and earned the friendship of his Highness.

† Named the *Caroline*.

Zanguebar with his new-born ship, and generally has the command of her for the first voyage to Europe or Singapore, always with the assistance of a European Navigator. On his return the Nakoodah generally feels tired or sick, and desires to retire for a while; to which the Imam assents, and then the happy Arab seaman takes to agriculture and settles down with ardour and industry in some select spot of Zanguebar or Pemba, where he plants a few acres of clove trees and goes on increasing his plantations every year. When the happy Nakoodah has built a house and has some twenty acres of clove trees in full bearing, he is startled one fine morning at the Durbar, where he comes regularly to pay his respects to the Sultan, by the announcement that His Highness wishes to purchase his farm for one of the young Princes. The Nakoodah bows, says "Alhumd-ool-illah," and receives a cheque on the Custom House Collector for five hundred dollars, exactly the value of the jungle he has so industriously cleared or planted—the actual value now being ten thousand dollars—and some times what is yet worse the Nakoodah has felled as many acres of cocoanut trees, the patrimonial property of his family for many generations, to give place to the more productive clove tree.

It is not only Nakoodahs who are daily exposed to such compulsory restitutions, bnt all persons in the employ of the Imam are liable to be in this way unexpectedly called to account for their past transgressions, and then the account is settled by the Imam with interest at a heavy rate. To my knowledge during the ten years from 1845 to 1854, about a dozen such sequestrations were made by Seyed Said. One of his parasite servants has alone been able to avoid the terrible day of settlement. This fortunate man was well known at Zanguebar by all Europeans under the name of Captain or Commodore Hassan, some of his European flatterers gave him the title of Admiral Hassan.

He was an old man when I knew him, with a sordid and mean looking face, always very well dressed, and wearing double green spectacles. He possessed one of the most comfortable houses in Zanguebar, furnished in the best European style. Captain Hassan had for a long time commanded the ships of His Highness, and had made many voyages to England and the United States; and

during the time of his service he had collected an immense quantity of "shavings", the favorite Africo-Arabian slang term for embezzlement. Captain Hassan was a man of great intellect, and being a very old and experienced officer, in 1846-49 was in himself a living Cyclopædia of the history of the Eastern Coast of Africa. He was very fond of receiving Europeans in his house, but such were his domestic habits, and so disgraceful was his private life, that no European of respectability could visit his house without incurring the reproach attaching to himself in the estimation of all the Arabs of Zanguebar. I was fortunately informed of this fact early on my arrival there, and to my great regret, I was obliged to renounce the pleasure of consulting such a treasure of information. Hassan had an immense fortune, all the produce of his plunder of the Imam's property when in charge of His Highness' ships. Seyed Said knew it, but never disturbed his old Commodore during his life, until 1850, when Hassan being on his deathbed, the Imam sent his vakeels and guards to take possession of all the fortune of the old profligate.

Having seen how the Imam gets his ships, let us see how he manages his dock-yards at Zanguebar and Muscat. The fleet of the Imam is composed of a dozen ships all above five-hundred tons measurement, three of which are of the size of frigates of 60, 40, and 36 guns—the *Caroline** is pierced for 24 guns, the remaining vessels of the fleet are pierced from 20 to 16 guns each, though few of them could ever carry one. There are besides five or six light brigs and schooners, scarcely more formidable than the native dows and certainly very inferior in sailing qualities to the generality of the dows and other craft of the Arabs of Muscat and the Persian Gulf. Since 1849 four large ships

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* The *Caroline* was built in 1820, and named *Caroline* in compliment to King George the 4th!! The ship was despatched to England on her first voyage with a present of horses and arms for the King, and jewels and precious stones for the Queen. The ship arrived in England just when Lords Brougham and Denman were rising to celebrity by their generous and talented defence of Queen Caroline. It may easily be imagined how George the 4th appreciated the delicacy of the Imam's compliment to his Queen.

have been equipped every year, one of which goes to London, one to France, one to Bombay and Muscat, and one to Singapore. The season of armament of these ships is from October to January; it is a time of excitement for his Highness and all his family, including even the immured ladies of his own and his son's harems. Every one prepares his or her little venture for each ship, and orders for the return cargo ; but it is most curious to see the proceedings at the dockyards,—if indeed I can call it a dockyard,—if I may apply a term suggestive of all that is order, intelligence and economy, to the damp and crowded godowns, where the stores of the disarmed ships are huddled together without any distinction or arrangement.

A Nakoodah wants a new topsail for his ship of 600 tons, he walks into the godown, and assisted by a gang of his lascars he drags forth a topsail, or may be a main or foresail, belonging to another ship of double the tonnage ; the sail is rescued from under a heap of blocks, ropes, grapnels, chains, casks, &c. and out of the bundle issue a number of discontented rats, who immediately make for another undisturbed sail ; the costly piece of canvass is unfolded and spread on the ground ; it is full of holes made by the tenants lately dislodged,—but that does not matter,—the Nakoodah with the help of some sail-maker marks off in the centre of this immense sail, the dimensions of that which he is in want of ; the new topsail is cut, the holes made by the rats are patched, and the remnant of the canvass, sometimes equal to the part turned to immediate use, is carelessly rolled up and sent on board his ship, where the lascars very soon manage to appropriate a few yards of it for bags, south westers and frocks for themselves.

If we return to the godown we shall perhaps find two different parties of lascars, each under the direction of their respective Nakoodah, pulling from under the rubbish some fine piece of coir, or perchance of fine hemp rope, brought from Europe by one of the ships on some former voyage : each gang pulls as hard as possible and coils the rope as fast as it comes out, when suddenly both parties came to a stand, they have pulled on both ends of the rope and have reached the middle of the coil ; after disputing for a moment, no party being disposed to give up his share of the con-

tested rope, it is cut where the hands meet and each crew carries off its lot in triumph, and when on board, they find it is some fathoms too short for the object intended. It is the same if a spar or yard is wanted; a carpenter will without remorse or shame, cut and chip a yard of seventy-five feet long, and out of such a magnificent and costly piece of timber turn out an uncouth and heavy topsaily yard for a ship of six hundred tons measurement: then comes the fight for chains and cables; here the scene changes the lascars will do wonders to secure the lightest of all in store; and were it not for the Nakoodah, would, I think, be satisfied with a couple of boat grapplings, and as many sheet chains, knowing that the lighter the cable and anchor the easier they are handed in.

In 1849 I had the misfortune to sail on board of His Higness' ship *L'Artemise;* five days after departure as I have already mentioned, we lost rudder and masts; from that day I took the command of the ship and after a very laborious voyage, I had the pleasure of making the harbour of Simon's Bay. It blew a gale from the south east the day of our arrival, and Simon's Bay is anything but safe and comfortable during a south east gale. When I ordered to prepare the chains and anchors, I was told that there were only 45 fathoms of one chain and 40 of another. There was, said the Nakoodah, " a beautiful new coir cable but it was deep in the hold and could not be got at without removing some thousand bags of cloves," and that during a gale of wind at the entrance of False Bay, eight miles (fifty minutes sailing) from the anchorage, and no possibility of laying to with jurymasts and rudder. I went in however, and by a miracle, the anchors stood well until assistance was afforded from shore. I left the ship immediately, it was my second Ulyssean voyage on board of His Highness' men-of-war and I had had enough of it. On her return home from London the *Artemise* was spoken in the Atlantic Ocean, some where about the equator, and since that time she has not been heard of. In 1854 I had the honor of seeing the Imam's eldest son Seyed Kaled, then Governor of Zanguebar during the Imam's voyage to Muscat; and the Prince told me that he had not yet lost all hopes of seeing the *Artemise* back; she might have been driven into some unknown region: there were, said he,

many such examples. Were the Imam not obstinately opposed to the idea of insuring his ships, one might think that he speculated on the bon-hommie or carelessness of the under writers.

Of all the Imam's fleet, only two ships had a fine appearance ; one is the *Shah Allum*,* a frigate pierced for 60 guns, built at Bombay: she has been lying moored at Zanguebar for the last twenty years with nothing but her bare lower masts standing and 24 guns for giving or returning salutes ; the other is the *Caroline*, a ship of about 800 tons built at Bombay, she went once to America and there was refitted in the dock-yard of the U. S. Navy at Brooklyn. The Nakoodah was told to help himself to every thing he could desire for the equipment of his ship ; and the Arab, thinking it was a present of the American Sultan to his great master, literally loaded the *Caroline* with all sorts of things useful and useless ; he was however requested to sign an inventory of all the things he had received, and when he came home triumphant from his refitting expedition he heard to his great terror that the Yankee Sultan had sent in his bill,—that it was an exceedingly heavy one, and that Said was mad against him, and eventually he had to pay the bill himself. On another occasion a ship of His Highness conveying a few horses as a present to the King of England was obliged to put in to Plymouth in distress ; the ship was refitted and sent back to Zanguebar, but no bill was ever presented to the Imam. It was on this occasion I think, that in answer to an autograph letter of Seyed Said, King William the 4th was graciously pleased to return an autograph of his own, in which the King of England said to the Sultan of Muscat, " Your Highness and myself are the only two sailor Kings in the world." The Imam was delighted with the comparison.

From what I have said of the mode in which ships are equipped at Zanguebar, the reader will come to the conclusion, that three-quarters of the Imam's ships are dismantled, and so it is ; they

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* The *Shah Allum* frigate, after remaining twenty years moored at Zanguebar without a single repair, was sent to Bombay with jury-masts in May 1854 to be completely refitted, there was not when she left a single rag of copper sheeting left at the bottom ; all had been oxidized and dissolved.

ride at anchor opposite M'tony with nothing but their lower masts, denuded of rigging, not an awning to preserve the decks from the burning sun, not a man to throw a few buckets of water daily on the parched sides of the ships. I dare say such a thing as a bucket is even unknown on board the Imam's ships of war.

During a long period the Imam and his predecessors had their ships built at Bombay, but for some cause unknown he turned his eyes to Cochin, and for the last fifteen years he has favored the latter place with his orders: the change has not been for the better, for all the ships built for the Imam at Cochin have very great defects and are dangerous at sea. In 1845 the Imam was desirous of having a ship built at Zanguebar; orders were immediately sent to India, and a ship-builder with a complete set of artificers of all professions for ship building, came at great cost to Zanguebar; and two or three hundred tons of well seasoned teak timber were sent from the Malabar Coast. There was nothing at Zanguebar to help on such an undertaking, so that numerous delays and disappointments occurred, notwithstanding which however a ship of 150 feet was laid on the stocks, and the work went on with some rapidity. When a piece of timber was wanted, it was immediately brought from the forests of the Island or of the African Coast, and cut, worked and set without allowing time for the wood to dry; every thing was pushed on with no other consideration than rapidity of execution, and the Imam was there daily urging the workmen and builders to expedite its completion.

In twelve months the frigate was ready and was launched, but not an attempt will ever be made to equip her; the Imam himself could not but confess that his first trial was a very unfortunate one. It is to be very much regretted, I think, that the Imam, when he listened to the adviser who persuaded him to make a trial of what could be done at Zanguebar in ship-building, only accepted the idea, leaving aside all questions of detail. The gentleman who originated the idea, and who was experienced in these matters, did not fail to tell the Imam that the first step was to have a provision of timber at least double of what was necessary for building his frigate, as every piece of timber left would be useful for other ships: the Imam was told that the trees should be felled

in a certain season, and allowed afterwards a long time to dry in well ventilated and covered sheds; iron and copper bolts and nails should in the meantime be procured from England; and generally all sorts of iron work should be sent ready made according to models furnished by the ship-builder. But the Imam, who has always been of a quick and hasty temper, had other counsellors who by their sarcasms destroyed the impression made by the advice of a wise and practical man, and it was decided that timber was cheaper and nearer at hand on the Coast of Malabar, than at a distance varying from 6 to 24 miles from Zanguebar; and in consequence two of the Imam's ships were sent for timber to Cochin and returned six months afterwards.

The originator of the idea having been Monsieur Broquant, the French Consul, an experienced officer who had served both in the Merchant Service and in the French Navy, need I say that his most determined opponent was the English Consul and Resident of the H. E. I. C., Captain, afterwards Colonel A. Hamerton ?* When M. Broquant arrived at Zanguebar, he was struck by the fact that the harbour was frequented by upwards of a hundred large square rigged ships every year, and that there was not at that part the means of making even very ordinary repairs, much less to refit a ship arriving in a leaky state, or after striking on some of the innumerable reefs of the neighbouring Coast. Country vessels were built and repaired at Zanguebar, but that sort of work was so different to what is required in repairing European ships, that the carpenters, caulkers and smiths of the country could by no means be turned to account by the Captain of a European ship in distress. The Coast of Africa, and the Island of Zanguebar itself, possess forests of excellent timber trees; labour is very cheap, and the cost of felling and sawing would be only a trifle; the quality and size of the timber are not inferior to the best Indian teak.

The African cocoanut trees yielding hard wood, three feet in diameter, free from sap, and eighty feet in length, are very com-

* Lieut. Col. Atkins Hamerton belonged to the 2nd Regt. Bombay N. I.; his knowledge of the Persian and Arabic languages was very extensive, and he was for seventeen years the Resident of the East India Company at the Court of the Imam.

mon. There are at Zanguebar more than a thousand dow carpenters, caulkers and smiths who might in one year be made good shipwright artificers. The French Consul was struck with all these favorable considerations. The high spring tides in the harbour afforded great facilities for hauling a ship high and dry for repairs ; and yet during the first year of his stay at Zanguebar, four good ships were declared unseaworthy, and sold at a great loss to the under-writers. The French Consul, considering that no harbour for repairs was to be found in the Indian Ocean south of the equator, with the exception of the Mauritius, where all repairs are exceedingly expensive, thought that it would be a philanthropic act of universal interest to turn the eyes of the Imam to that subject ; he told His Highness that he would act wisely in building his ships in his own dominions, and he explained to him all the considerations of economy we have related above, he also threw into the balance the glory resulting to the Imam in having his own dock yards ; but of the facilities the execution of this project would afford to Christian ships, not a word was said, or the suspicious Sultan would have at once rejected the scheme ; the French Consul was partly successful and the construction was resolved on by the Imam, " Insha-allah !"

Then the project was made public, and from that moment all influences were stirred to bring the undertaking to as poor a result as possible. The timber, iron and copper were brought from Bombay and the Malabar Coast ; the builder was an ignorant fellow, his fabric was an ugly unseaworthy hulk ; and when the expenses were summed up, the unlucky ship was found to have cost nearly twice what would have been charged at Cochin. The Imam would hear no more of such experiments, and builder and artificers were at once dismissed.

What could have induced Colonel Hamerton to oppose so strongly the opinion of his colleague and friend Captain Broquant ? The French Consul's ideas were sound, wise, based on perfectly evident facts, and supported by Christian and commercial reasons of the highest and most respectable order ;—but they were originated by a Frenchman, and that was sufficient to lead the English Resident to oppose them *per fas aut nefas.* The French Consul—

a very little personage at Zanguebar compared to the all-powerful English Resident—could have no political motives concealed under the considerations of economy he urged in recommending the scheme to Seyed Said. The English Resident on the contrary, (independently of the very legitimate desire he had of continuing to Anglo-Indian subjects the rich harvest yearly afforded by the ship-building mania of the Imam,) feared perhaps the possibility of the creation of a Dockyard in these seas, and the comparative independence of English aid and influence which the Imam of Muscat might derive from it.*

The French Consul, the Imam Seyed Said Ben Sultan, and Lieut. Colonel Atkins Hamerton are all dead; they had all three a noble sense of their duties to their respective countries and an inexhaustible and large-hearted kindness to all travellers, whether countrymen or strangers. In relating the little strifes of their political intercourse, I cannot but add how unfortunate it is that, actuated by unceasing rivalry, France and England have hitherto so seldom acted together even when a question of general interest is at stake. The French Consul M. Broquant, Chevalier de la Legion d'Honneur, died at Zanguebar in May 1847 of dysentery; the Imam of Muscat Seyed Said Ben Sultan died in 1857; the English Consul Colonel Hamerton died of dysentery at Zanguebar on the 6th July 1857. All three, the Frenchman, the Englishman and the Arab, are gone before their Maker, but the remembrance of their hospitality, kind hearted manners and valuable qualities, will survive many generations of African travellers, and will ever be held as a sacred recollection by the writer of these *Notes.*

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* Our readers will remember that the writer of these interesting Notes is a Frenchman, and that without casting the slightest reflection on his good faith, we may reasonably presume that he writes with a natural bias in favour of the French Consul.—(Ed. M. L. J.)

## X.—*Remarks on* Major Cunningham's *Account of Topes at Bhilsa, and Sanchi.* By the Rev. W. Taylor.

Lieut. Cunningham's name often appears in the late Mr. J. Prinsep's papers; in various numbers of the *Bengal Asiatic Journal.* Indeed they would seem to have been patron and client, master and disciple. Major Cunningham is still true to his allegiance; considering his principal to have been, in some measure, inspired, when discovering the mode of decyphering the very old *lat'h* inscriptions. He is true in another particular; that is, philhellenism. Mr. Prinsep remarked on the coldness with which mere Asiatic researches were received; but on the glow of enthusiasm that was elicited, if any thing Grecian turned up therein; for instance when Sir W. Jones identified the Sandracottus of the Greeks, with *Chandragupta* of the *Mauryan* dynasty. Mr. Prinsep imitated this result; when noting an old inscription from Cuttack, he read *Yavana Antiochus;* that is "the Greek Antiochus." He gave the original letters; and I read them *Yavana antaca,* that is, "the destroyer of the Bactrians." I had no reason to change *a* into *io*, nor *ca* into *chus.* A like defect is frequently found in Mr. Prinsep's decypherings; some of which at least will come under review.

Major Cunningham also, in my opinion, found a mare's nest in the following case. Here are his words:—

"Before parting, may I beg to draw the particular attention of the reader to my identification of the different classes of *Pramnae* and *Germanae,* as recorded by Kleitarchos and Megasthenes, with the different orders of Buddhist *Srămanas.* I do so because some of our most eminent scholars have doubted the prevalence and extension of the Buddhist religion, before the beginning of the Christian era. Now the *Pramnae* of Kleitarchos, and the *Germanae* of Megasthenes, are both stated to have been the opponents of the Brahmans.* Were this the case they can only be the *Srămanas,* which was a title common to all the orders of the *Băuddha* community; even Sãkya himself being styled *Māha Srămana,* or the "great devotee." The identity of the *Germanae*

* As to religious credence.—W. T.

of Megasthenes is placed beyond all doubt by his mention that "women were allowed to join them on taking vows of chastity,"* for the Buddhists alone had nuns.

It will not, I trust, be out of place, in a Preface, to observe that the several orders of *Pramnae*, mentioned by Kleitarchos, are,—

1. *Ορεινοι* or "mountaineers," a Greek corruption of *Arhan* (or *Aran*, as it is sometimes spelt), which was a common title of the Bodhisatwas, or second class of the Bauddha community, who usually dwelt on hills.

2. *Γυμνηται*, "the naked," or rather the "half-clad,"—a descriptive title of the *Bodhisatwas;* who, during their devotions, wore only the *sunghāti*, or kilt. *Γυμνης* or *Γυμνητης* was applied to a light-armed soldier,—not to an unarmed one; and, therefore, also, to a lightly clad person.

3. *Πολιτικοι*, the "townsmen," I only take to be a corrupted transcript of the Sanscrit *Pratyeka*, the third class of the Bauddha community; whose duty it was to mingle with the people, and frequent the towns.

4. *Προσχωριοι*, the "rural," which I take to be an alteration by some copyist, for the sake of the antithesis of "town and country," with the last. The original term used by Kleitarchos was, I see reason to believe, *Προσεχωριοι* the "listeners," a literal translation of the Sanscrit *sráwaka*, the fourth class of the Bauddha community.

"It is my belief that I have identified both the *Ορεινοι* and the *Γυμνηται* with the Bodhisatwa of the Buddhists. For, though there were four classes of Buddhists; yet, the superior grade being those who had attained the rank of Buddha, they had, of course, no representatives on earth. Kleitarchos, therefore, who had heard that there were four orders, has created one out of the *Γερμαναι*. Megasthenes, who resided for some years in India, states more correctly that there were only three class of *Γερμαναι*, viz.,

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* Megasthenes in Strabo v. *Συμφιλοσοφεῖν δενιοις και γυναικας δεχομενας καὶ αυτᾶς αφροδισιων.*

1. Υλοβιοι, from the Sanscrit *alobhiya*, "without desire;" that is, the Bodhisatwa, who had suppressed all human passions.

2. Ιαλ̓ρικοι, the "physicians," which I take to be a slight corruption of Πραλικοι, for *Pratyeka*, the third class of Buddhists; who, as they mixed much with the people, would no doubt have generally acted as physicians, as the Christian monks have done in later days.

3. Επαιλαι, or "beggars," equivalent to the *Bhikshu*, or mendicant monk of the Bhuddists.

"Now Kleitarchos was one of the companions of Alexander; and, as he did not advance into India beyond the Hyphasis, or Byas River, his distinct mention of the different classes of the Bauddha community seems (to me at least) conclusive, that the religion of *Sákya* had not only become prevalent in Gangetic India, but that it had reached the Punjaub at the period of the Macedonian invasion, B. C 330.

"Let me add that a still earlier mention of the *Buddhists* may, I think be found in Herodotus; who, writing about B. C. 420, shortly after the assembly of the second Synod says,—"There are other Indians, who, differing in manners from those before mentioned put no animal to death, sow no grain, have no fixed habitations, and live solely upon vegetables." The name of this class of Indians is not given by Herodotus; but it is preserved by Nicolaus Damascenus, who calls them *Aritonii*, the same, I believe, as the Sanskrit *Arhanta*. Now *Arhanta* is a title of the *Bodhisatwa*, one of the classes of the *Bauddha* community which observed all the peculiarities attributed by Herodotus to the *Aritonii*. They were prohibited from taking life; they sowed no grain; but begged their daily bread; they had no fixed habitations, and lived wholly upon vegetables."

Now it is obvious that these were not Bauddhas because the Bauddhas had no caste; the severe rule of *Buddha* enjoined mendicancy, and a subsistence only on food obtained by begging. The various separations, voluntary or forced, were occasioned by dissatisfaction with the strictness of the rule. When a considerable number had joined in this dissatisfaction, the result was a solemn convocation; always ending in confirming the rule of the founder, and expelling

the dissentients. One large section retained fire-offerings, tantamount to the worship of fire; and they were in consequence cut off from the main-body. These (the *Jainas*) also retained caste with the exception of the second order. They also had nuns; for Lieut. Burnes, when he visited a temple to Parsvanatha in Gujerat, saw therein a female ascetic, who explained to him what he wished to learn concerning that fane. As to the word *Pramnae* it is evidently the 'Brahmanies' that may be heard in the mouth of the East Indian community at Madras; a word variously modified, in different dialects—*Bahmini* in the Mahomedan Dekhini; பார்பார் *Pārpār* in the Tamil; *Flamen* in Latin. The old Romans had four divisions—the *Flamen* corresponding with the Brahman; the Knight corresponding with the *Cshetriya*, the *Patrician* corresponding with the *Vaisya*, and the *Plebeian* corresponding with the *Sūdra*. The townsman and the rural, (Ορειvος and Πoλιτικος) in the above extract, correspond with the *Bhūvaisya*, and the *Dhana vaisya*, or grain merchant and cultivator.

A like statement recurs in the body of the book: Col. Cunningham did not wish it to be overlooked; nor has it been.

The late Mr. Prinsep was an amiable, ingenious, indefatigable man; but he was hasty, and made astonishing leaps towards a conclusion. His many duties left him little time to spare, so that he wrote for his journal in haste; and, it is observable that he cared more for brilliancy, than for solidity. Would any dashing idea give his journal wings? Off it went. He was, at the same time, ingenuous; promptly admitting error, when fairly convicted. I have thought that, phrenologically, he had the organ "individuality" largely developed; as evidenced by his pains-taking etchings of Bactrian coins; by his nicely invented balance for weighing the precious metals; and, by a keenness of perception, given but to few. Persons so constituted always have obliquely retreating foreheads: consequently defective in "causality" and "comparison." Sir Isaac Newton, if his statue at Cambridge may be trusted, had such a forehead; the projection of forehead over the eyes being extraordinarily large, and thence retreating at an angle of perhaps seventy degrees. Hence his astonishing

power at a mathematical demonstration ; and his weakness in a pure theory or hypothesis. Locke, on the contrary, had a bold, high, and perpendicular forehead ; "causality" jutting out in two decided lumps : he was a metaphysician.

Mr. Prinsep looked with a longing eye at the very old *lat'h* characters ; how brilliant ! could any thing be made out from them. It occurred to him that Buddha-Gaya votive earthen-vessels bore on them short inscriptions, in the common dialect, with the word *ă* or *Dănam*, that is, gift. Very numerous, and equally brief inscriptions at Bhilsa, Sanchi and other places, in the *lat'h* letter, uniformly ended with like letters ; *ergo* this word *must* be *Dănam.* In another foot-note he considered the inscription to be either funereal, or votive. He chose the wrong sense ; for the word in reality is '*layam*,' death, or loss. In many letters Mr. Prinsep was unquestionably right ; but in many more wrong. Dr. Babington, under guidance of Boriah, Col. McKenzie's Brahman, used the *Grantha* character as a key to the inscriptions at Mamallapuram. Most eagerly was this reading accepted at Calcutta. But it is a false guide. I found that a letter like the one for *m* was *k*, and another with equally slight variation was *d*, of this fact there could be no doubt ; a Canarese Brahman (who had never seen *Mamallapuram*,) so read the letters. Add, the above mistake of reading *d* for *l*, *n* for *y*, *dānam* for *layam ;* and nothing more would be requisite (though more there is) to falsify all Mr. Prinsep's decypherings. I have no doubt of their incorrectness : his alphabet was useless, when applied to the *Amarávati* letters ; though these are identical with those in inscriptions at Bhilsa, and other places.

Major Cunningham has, in the heading of a chapter, more *dánams.* Mr. Prinsep, from meeting with the Bauddha's formula *Ye dhamma*, &c. concluded that the language was that of *Magadha* or the *Páli.* He had a Cingalese servant with him, who gave him the formula with its sense ; and this man acquired his unbounded confidence. By means of wresting, twisting, altering, the *lath* inscriptions were harmonized into a meaning ; and the result was proclaimed in the journal, as might be expected, to be perfect and final. One proof of Mr. Prinsep's *bonhommie*, recorded by himself, is surprising : there was one word, just the thing : only

the vowel was short, when it should be long. Mr. Prinsep left the work dissatisfied. " What was my agreeable surprise," writes he, " on returning, and looking again, to see that the vowel *was* long!" Prodigious ! with what little compunction his Cingalese servant would add the small mark, when found needful to please his master, did not occur to Mr. Prinsep. His good nature was overflowing : pity it is that such men are always cheated every where, but in India and by Moonshees especially. I may here take occasion to notice that two of the words on the great tope No. 1 at Sanchi ; to wit *rāca* 'not coming' and *toligi* 'rejecting' are *atsa* Telugu; having no relation to Sanscrit.

The most valuable portion of Major Cunningham's book, contains the drawings, ground plans, measurements, and their descriptions. Here, as an Engineer Officer, he was at home. I make an extract descriptive :—

" A view of this remarkable stone-railing is given in Plate IX., which shows the general disposition of the numerous inscriptions. The style is evidently characteristic and conventional ; as it is found wherever the Bauddha religion prevails.* It is in fact so peculiar to Buddhism, that I have ventured to name it " the Buddhist railing." This peculiar railing is still standing around the principal topes at Sanchi and Andher ; and some pillars, and other fragments are still lying around the great topes at Sonári and Satdhára. The same railing was placed around the holy Bodhi trees, and the pillars dedicated to Buddha. The balconies of the city gates, and of the king's palace, were enclosed by it. It formed the bulwarks of the State Barge. It was used as an ornament for the capitals of columns, as on the northern pillar at Sanchi ; and generally for every plain band of architectural moulding. At Sanchi it is found in many places as an ornament on the horizontal bars which separate the bas reliefs from each other."

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* No less than nine specimens of this kind of railing were found amongst the Bhilsa Topes; all of which are described in the following pages. In Plate IX. Fig. 3, I have added a specimen from the great Dipaldinna Mound at Amaravati, for the description of which, see Prinsep's Journal, Vol. VI., Plate X.

I regret the not having seen this book, before completing my report on the Elliot marbles. Such railings are among them. Further research, among the Government Manuscripts, explained to me what was dark, as to the *Dagobahs* ; which, I noted in several cases, showed a serpent at the small entry beneath. It appears, that the word *Kundali*, which properly means a snake is applied metaphorically to the female nymphae. Thus the Dome represented the female abdomen, as that represented universal nature, the object of *Jaina* worship ; the snake-aperture represented the vulva, and the snake the nymphae. What Dr. Benza conjectured might be architraves were funereal tablets ; and the joyful emblems, on some of them, however incompatible with our ideas, indicated that, in the judgment of survivors, the deceased—no matter whether man or woman—had obtained *nibutti ;* that is the mortal shell being broken, the soul had become re-united to the universe : for they knew of no other bliss. Death could not be always disarmed of its terrors, as the tombstone of a deceased grazier plainly evidenced ; the Cobra capella there has a very different interpretation.

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## XI.—*Discovery of a New Planet* "Asia." By N. R. Pogson, Esq., F. R. A. S., *Government Astronomer.*

A new Planet, resembling a star of about the 12th magnitude, was discovered with the equatoreal of this Observatory on the night of April 17th, 1861. Its detection was the fifth similar result of a systematic search, maintained for some years past in certain portions of the zodiacal heavens, aided by manuscript charts of my

own construction. This last circumstance enables me to assume with reasonable probability, that I shall not have been preceded elsewhere ; an unpleasant contingency to which all are liable who use only *published* Charts. Co-incident with the announcement I have therefore ventured to name the new Planet, as Europa, Doris, and several other of the Oceanides have been similarly celestialized, I did not scruple to draw once more upon the same sisterhood, by selecting the name Asia, so peculiarly applicable to the first discovery yet made in this quarter of the world.

The Madras Equatoreal, having been mounted by my esteemed and able predecessor Captain W. S. Jacob, at his own private expense, (though afterwards purchased by Government) for the express purpose of accurate measurement of double Stars, is not supplied with the more rough and ready requisites for the less refined but perhaps equally important observations of faint Planets or Comets. For them, the slightest amount of illumination which will render the spider lines of a wire micrometer visible, is complete annihilation, and they can therefore only be observed in a perfectly dark field of view. The best and most proper tool is a ring-micrometer. Failing that however, there is another method, invented by the late Count Von Boguslawski, of Breslau, whereby, using two comparison stars instead of one, the place of an unknown object may be determined with merely a straight bar or wire instead of a micrometer. If the comparison stars are well selected, great accuracy is attainable, but it must be confessed at the expense of much needless time and labor, both in the observation and in its subsequent reduction. The following observations of the new Planet Asia were all taken by this method ; thanks to my good friend Lieut. Col. W. K. Worster, who happened most fortunately to have just fitted a suitable straight bar into the focus of a positive eyepiece. The positions marked R were observed and calculated by one of my native assistants, C. Ragoonatha Chary, whose aptitude in thus picking up a new and rather confusing method of observation and reduction, and that too in leisure time as a voluntary contribution to science, reflect the highest credit upon him. I believe all the places to be as good as could have been procured of so faint an object by the most refined means ;

although as before remarked, at the cost of more than double the time and trouble they ought to have given.

| Madras Mean Time, 1861. | | | | Apparent Right Ascension. | | | Apparent North Polar Distance | | | Number of Comparisons. | Observer's Initial. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | *h.* | *m.* | *s.* | *h.* | *m.* | *s.* | ° | ′ | ″ | | |
| Apr. 17— | 12 | 53 | 40 | 15 | 51 | 14.76 | ...... | ...... | ...... | 5 | P |
| ,,— | 14 | 7 | 37 | 15 | 51 | 13.56 | 106 | 6 | 22.9 | 10 | ,, |
| 18— | 11 | 50 | 39 | 15 | 50 | 50.72 | 106 | 1 | 12.7 | 12 | ,, |
| 19— | 13 | 49 | 27 | 15 | 50 | 20.72 | 105 | 55 | 7.0 | 9 | ,, |
| 20— | 11 | 46 | 44 | 15 | 49 | 53.93 | 105 | 49 | 50.1 | 8 | ,, |
| ,,— | 13 | 20 | 12 | 15 | 49 | 51.84 | 105 | 49 | 26.6 | 12 | R |
| 21— | 11 | 59 | 5 | 15 | 49 | 22.97 | 105 | 43 | 55.3 | 13 | P |
| 23— | 12 | 13 | 6 | 15 | 48 | 15.72 | 105 | 31 | 57.3 | 11 | ,, |
| ,,— | 13 | 31 | 56 | 15 | 48 | 14.04 | 105 | 31 | 31.4 | 10 | R |
| 28— | 10 | 31 | 4 | 15 | 45 | 6.30 | 105 | 0 | 51.8 | 8 | ,, |
| ,,— | 11 | 57 | 33 | 15 | 45 | 3.26 | 105 | 0 | 30.4 | 12 | P |
| 29— | 9 | 55 | 49 | 15 | 44 | 24.56 | 104 | 54 | 32.8 | 8 | R |
| ,,— | 11 | 58 | 23 | 15 | 44 | 19.78 | 104 | 54 | 5.5 | 9 | P |
| 30— | 10 | 12 | 56 | 15 | 43 | 39.05 | 104 | 47 | 49.7 | 8 | R |
| May 1— | 9 | 46 | 11 | 15 | 42 | 54.97 | 104 | 41 | 16.6 | 8 | ,, |
| ,,— | 13 | 0 | 13 | 15 | 42 | 48.11 | 104 | 40 | 18.4 | 12 | P |
| 2— | 11 | 34 | 17 | 15 | 42 | 4.89 | 104 | 34 | 6.8 | 9 | R |
| ,,— | 13 | 3 | 18 | 15 | 42 | 1.79 | 104 | 33 | 42.4 | 10 | P |
| 3— | 11 | 12 | 33 | 15 | 41 | 17.88 | 104 | 27 | 31.8 | 12 | ,, |
| ,,— | 13 | 4 | 26 | 15 | 41 | 13.97 | 104 | 26 | 56.3 | 12 | R |
| 11— | 13 | 16 | 47 | 15 | 34 | 17.61 | 103 | 32 | 3.8 | 14 | P |
| 12— | 10 | 15 | 45 | 15 | 33 | 30.18 | 103 | 25 | 58.1 | 18 | ,, |

The magnitude or brilliancy of the Planet has been estimated on ten nights as follows :—

| | | | |
|---|---|---|---|
| April 17 | ..........12.0 | May 1 | ..........11.0 |
| 18 | ..........11.7 | 2 | ..........11.0 |
| 19 | ..........11.2 | 3 | ..........10.8 |
| 21 | ..........11.5 | 11 | ..........10.6 |
| 29 | ..........11.0 | 12 | ..........11.0 |

I may here remark, that all estimations of magnitude are based upon my photometric formula for any telescope, viz.—

Limit of Vision $= 9.2 + 5 \times$ log. aperture in inches :—

The ratio of light for one magnitude being 2.512, i. e.—that a star of a certain order contains two and a half times the light of the next fainter class. —Thus the naked eye penetrating to the 6th magnitude, a telescope one inch in aperture will shew Stars of the 9.2 magnitude; one nine inches in aperture the 14th magnitude, &c. &c.

MADRAS OBSERVATORY, *June* 10, 1861.

N. R. POGSON, *Government Astronomer.*

## XII.—*Reports on Ancient Architectural Remains in the Madras Presidency.*

From Captain E. H. Harington, Acting District Engineer, Ganjam, to the Deputy Chief Engineer, Northern Circle, dated Camp at Chicacole, 11th July 1859, No. 82.

With reference to Chief Engineer's Circular, No. CXIV. dated 27th September 1858, I have the honor to offer the following information regarding a very curious old inscription on a rock near the village of Naugám in the Pubbakonda táluq of the Ganjam District, about three miles from the táluq station of Pursatpúr, near the Rushkulia river.

Antiquities.

2. The rock stands in a quadrangular space, enclosed by high enbankments, indicating ancient fortifications. This place is called Jonghar or Lac Fort. It is marked by dotted lines in most Maps.

3. I believe the inscription has been very carefully copied in 1850, by direction of the Honorable Mr. W. Elliot. In December 1858, four photographs of it were taken by Mr. Minchin, who sent them to Mr. Elliot. Mr. Minchin has kindly showed me Mr. Elliot's letter to him on the subject, in which that gentleman states that, " the inscriptions no doubt contain another version of Asoka's " Buddhist Edicts, which have been translated by Prinsep and " Professor Wilson, and revised by Mr. Norris, the Secretary to " the Royal Asiatic Society, London ; that the letters are of an " Alphabet, the earliest used in India, and the parent of *all* those " now in use, however, dissimilar they may now appear ; that it " has been proved that the Nágari, Bengali, Guziráti, Mahratta, " Telugu, Canarese, Tamil, &c. are all derived from this common " source, namely, the *Lat.* Alphabet, so called from its earliest use " on Rocks and Pillars." He adds that the " letters show the in- " scription to have been carved in the third century before Christ, " or upwards of 2,000 years ago."

4. Asoka is stated in history to have been the third descendant of the Greek conqueror Sandracottus, who has been identified with the Chandra Gupta of Hindu poetry and legend.

5 I have received from Captain Philipps, Executive Engineer, two photographs of the inscriptions, given to him by Mr. Minchin, and as they will be interesting, forward them with this letter.

6. The inscriptions are not complete, and the face of the rock is gradually decomposing. Perhaps it would be possible to save the rest from obliteration and decay, if the patent liquid which I believe has lately been used in England, and France, for preservation of stone-work, could be applied. Captain Philipps thinks this would cost 10 Rupees, at 1 Rupee per square yard.

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From Captain JOHN MULLINS, District Engineer, Nellore, to Lieutenant-Colonel J. H. BELL, Chief Engineer, dated Camp Kavili, 18th June 1859, No. 1,293.

With reference to the memorandum published at page 1,197 of the Fort Saint George Gazette of the 14th instant, regarding the Annual Return of Interesting Memorials, I have the honor to inform you that in my letter of the 15th December 1858, No. 2,792, a Report on the Inscription Stones on the Anantaságaram Kálvai and Kalúr Tank Bunds was forwarded and no interference with them was recommended. This Report was noticed in paragraph 1 of the Proceedings of Government, dated 14th April 1859, No. 882.

2. Since that time, one other relic of by-gone days has been insited by me, and an account of this work, the Fort of Udiagiri, was entered in my Inspection Report for the month of February last.

3. I did not understand that an Annual Summary was required of all such investigations, but I beg now to enclose a Statement containing the information originally furnished in the documents above noticed.

4. With regard to paragraph 4 of my letter No. 2,792, of the 15th December last, I may add that application has been made to the Collector for such information on the subject of the ancient works of the country as the Húzur and Táluq records can afford.

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STATEMENT OF PARTICULARS OF INTERESTING MEMORIALS FOUND IN THE NELLORE DISTRICT.

*Inscription Stone.*

On the Tank Bund of the Anantaságaram Tank. The Tank is a remarkably fine Reservoir, retaining a depth of water, when full,

of not less than 40 feet at the principal Bund, which is placed between two rocky hills, and which is very carefully revetted on both sides and at top with large blocks of hornstone. The Inscription Stone is placed on this Bund. It is 10 feet high. On the top is a sculpture, apparently a copy of a seal, below which the inscription is cut; this stone is of a soft description, and the inscription (a translation of which follows), is almost obliterated.

*Translation.*

In the reign of the Rájá Mahárájadi Rájá Paraméswara Srí Krishna Dévaráya Mahárája, an energetic, courageous, and virtuous King, one Ráyasam by name Konda Murusugáru, for the sake of charity to his father Timmarsu and his mother Sangayemma, founded this called Anantaságaram Tank on the 15th of Jéshta of the year Vikrama of the Era of Sáliváhana 1443, corresponding to the year 1522 of the Christian Era.

This has been copied as correctly as the appearance of the letters admits. In some places the letters were almost entirely erased.

*Karanams.*

(Signed) D. APPAYA,
( „ ) VENKATASUBAYA,

(True Copy.)

(Signed) H. SRÍNIVASA ROW,
*Tahsildar.*

*Inscription Stone on the Bund of the Kálvai Tank.*

This also is a very fine Tank. The Inscription Stone is small and certainly appears to have been fixed on the Bund at a much later date than the year mentioned in the inscription; the following is a translation of its record.

In the reign of the Rájá Mahárájadi Rájá Paraméswara Srí Krishna Dévaráya Mahárája, an energetic, courageous and virtuous King, one Ráyasam by name Konda Murusugáru, for the sake of charity to his father Timmarsu and his mother Sangayemma, founded this called Kálvai Tank, and established a Goddess, named Mallamma on its Bund, with the construction of Temple for her,

on the 15th Visákha of Pramádi year of the Era of Sálivábana 1441, corresponding to the year 1520 of the Christian Era.

*Karanams.*
(Signed) VAINTAPARTI PITCHAYA,
( „ ) KARANAM NARASIMMULU,
( „ ) N. SUBBA RAU, *Péshkár.*

(True Copy.)

(Signed) H. SRINIVASA RAU,
*Tahsildár.*

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*The Fort on Udiagiri Drúg.*

This Mountain is a very extraordinary one, standing out about 10 or 12 miles to the east of the line of Mountains dividing Cuddapah from Nellore. The height of the crown varies from 1,800 to 2,800 feet above the sea, and it has been, and in fact is, a place of great strength. About 9-10ths of the hill is rendered inaccessible, except by the three or four paths communicating with the low country, by precipices varying from 400 to nearly 1,000 feet in height, and every path is defended by several lines of fortification, aided by horse-shoe towers, which, built upon every rock commanding the roads or rather steps, render it a very formidable place to attack. The northern part of the hill is lowest, and on this side is the principal approach, which consists of a flight of steps, running along the face of a deep ravine, and commanded by several towers and many lines of rampart and bastion. Within the fortifications is a small village. The southern or highest part of the hill is connected with the northern by a narrow way flanked on either side by precipices, with very precipitous paths to the low country on the east and west sides, and here again the fortifications are very numerous though not in such good repair as on the north. This southern hill is the highest, and from within the fortifications which enclose it, there is only one path to the low country, constructed almost entirely in masonry steps along the face of the precipices on the west side. This stair-case is a most extraordinary work, taking advantage of every mass of rock which could give it some support and zigzagging along and under overhanging cliffs many hundred feet high, while the sheer drop from the edge of the

steps is in many places 100 to 150 feet. These stairs lead to a lower line of ramparts on the west side, within which the principal supplies of water are found. The climate on the top of the hills is delightful, being about 15 degrees cooler than Udiagiri itself; the water is most excellent, though difficult of access from the higher levels, while the hills appear from the accounts of the villagers to be entirely free from fever at all times of the year, and the water is celebrated all over the district. Some of the views are most admirable, and it is strongly recommended that the Government Photographer should spend a fortnight there in taking views of some of the fortifications, and of the overhanging cliffs, precipices and ravines.

The hill is almost entirely composed of hornstone, a few pieces of new red sand stone were picked up, but the guides said there were no quarries of it, and that it was merely found in detached boulders here and there.

*Camp Kavili, 16th June* 1859.

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From Captain E. HEMERY, District Engineer of Cuddapah, to Lieut.-Colonel E. LAWFORD, Deputy Chief Engineer, Central Circle, dated Camp Madanapalli, 22nd June 1859, No. 237.

My Annual Report on interesting Architectural Remains has this year been delayed owing to my desire to inspect an old Hindu Temple near the village of Sómpalli in the Madanápalli táluq of this District, to which my attention had been directed by the Chief Engineer.

2. The history of this Temple is as follows :—

3. About 800 years ago, two brothers came from a place called Yellúr, in the Kadri táluq and settled in the neighbouring táluq of Madanapalli; the elder brother built a small fort and village at Kókanti, whilst the younger brother named Kásinayadu founded a town called Kashni Kotta, now in ruins.

4. Kasinayadu also built a Pagoda near Káshni Kotta which he dedicated to Vishtnu under the name of Chenna Késava Swámi.

5. There is nothing remarkable about the architecture of this Pagoda, which consists of an enclosed quadrangle with the usual

shrine in the centre, where the statue of the God is kept but in the west corner of the quadrangle, there is a raised platform with a canopy supported on four pillars, under which the idol was placed at certain annual festivals.

6. The whole of this structure is formed of very curiously carved black granite, and in niches in the wall, on three sides of this platform, there were formerly 12 stone images said to represent the servants of the God.

7. Only three of these statues now remain; they are made of black granite finely polished about four feet high, but they are very much mutilated and defaced.

8. It appears from documents in the possession of the direct descendant of Kasinayadu, that about 70 years ago, a horde of Mahrattas invaded this part of the country and destroyed the Pagoda, breaking nine out of the twelve statues to pieces, and very much injuring the remaining three.

9. In front of the Pagoda, there is a finely carved monolith of white granite, about 50 feet in height, and scattered about are fragments of beautifully fluted columns, also of white granite.

10. The Pagoda could not be repaired under an expenditure of a thousand Rupees, but a great boon would be conferred on the descendants of its builder, by restoring a small extent of inám and which had, for many generations, been appropriated to the due performances of certain ceremonies in the Pagoda.

11. It appears that about three years ago, the Pújárí or warden died, and since that time, the inám land attached to the Temple has been temporarily resumed until another Pújárí was nominated.

12. The people all told me that another Brāhman had been selected for that office, and as the inhabitants of this part of the district attach very great importance to the celebration of certain feasts, and to the regular performance of religious ceremonies in this Pagoda; I would venture to suggest that the subject should be brought to the notice of the Acting Collector.

## REPORT ON INTERESTING MEMORIALS IN THE DISTRICT OF NORTH ARCOT.

From Captain H. L. Prendergast, District Engineer, North Arcot, dated Ránipet, 18th August, 1859.

1. Arcot.—The old Fort of historical renown, is now become portion of the town, covered with houses and gardens, and the trace of it is not to be clearly distinguished. Old drawings represent an irregular parallelogram, with many round towers, surrounded by a wet ditch, a regular covered way, and glacis : an advanced ravelin is shown on the north side, and a gateway on the east and west sides : the east gateway facing the river is the only remnant of these, and it is of very ordinary construction : one would imagine the remains of a bastion protecting this entrance, but the stone has been removed for building purposes, and the trace is not clear. It is curious to observe that an old plan signed " John Call Chief Engineer," shows paddy fields, and buildings outside, to the eastward, whereas at present the river comes up to the very foot of the gateway ; there are no signs of such in the bed of the river, but it is not impossible that the river has encroached on its former banks, and has been arrested by the line of old walls of the Fort.

2. Arni.—About six miles from Arni a little off the road to Vellore, are the graves of some of the Officers and men, who fell at the battle of A'rni ; a wall now partially destroyed surrounds the enclosure: the slabs which recorded the names of those buried, have been carried away by the villagers. The road is likely to be soon restored between A'rni and Vellore, and I think a sum of Rupees 300 might be laid out, in restoring the wall of the burial ground ; the names to be recorded are lost but Government might approve of a simple slab being inscribed, to the memory of the Officers and Soldiers, who lost their lives at A'rni.

3. Chendragiri.—Fort consists of a rampart 1¼ mile in circuit, with bastions and towers surrounded by a ditch : the gateway is formed of single blocks of granite, and the roof consists of fine slabs with the old rude sculpturing of Hindu Mithology. The principal palace is composed of three stories, about 50 feet in

height: surmounted by one central tower, and a smaller one on each flank: the basement measures 150 feet by 50. The walls are of cut granite: the lower story of large blocks, and these diminishing in size in the 2nd and 3rd stories: the towers being built of brick. Each story has the little old windows opening on small balconies; the latter are falling to pieces. The lower part of the building from its massive structure is in good preservation; the upper brick and plaster work, showing the effects of age: this portion is highly ornamental, and a sum of Rupees 500 might be laid out in arresting the progress of decay. A smaller Palace of the Ráni's adjoining, is much more of a ruin, and has not the same pretensions to architectural beauty. By local tradition it is stated that the Rájá Venkatapati Dévu Mahárájulu, constructed these edifices in the 15th century.

4. AT IRINJIPURAM.—There is a large Pagoda built of fine cut stone, in good preservation. There are fine carvings on the walls, but beyond the size of the building; there is not much to attract attention. On the west face, there are the marks of shot which struck the building in the battle which was fought near the spot.

5. THE TIRUPATI Pagoda from its sacred character, being a resort of pilgrims from all parts of the country, is an object of interesting investigation. The Pagoda is jealously guarded, so that an European is not allowed within a considerable distance; it is built in a hollow of the hills about seven miles from the town of Tirupati. There are three gateways leading to the Pagoda, through the first on the ascent from the town, only Hindus are allowed to pass, all other castes being excluded. One of the incarnations of Vishtnu, the serpent Sésha is supposed to have been transformed into the Tirupati Hill; hence pilgrims prostrate themselves to the ground, on their first view of the hill. The idol, a personification of Vishtnu, worshipped under a thousand different names, is an erect stone figure, seven feet high with four arms. The Bráhmans assign a fabulous antiquity to the Pagoda, that it was erected in the commencement of the "age of contention" of which nearly 5,000 years have elapsed. The name of the founder is handed down, as Tandiman Chakravarti, a Rájá of Tirupati. The crowds

of pilgrims that flock to the Pagoda, bring each a gift of money according to their means, which funds are fabulously recorded as a re-payment of the nuptial expenses of the idol, with the daughter of the Rájá of the neighbouring Náranavaram. The amount of wealth is allowed by all persons, to be enormous, which is in the hands of the priests. The shrine is accordingly kept in preservation, and will never require the aid of Government, to preserve it from decay.

6. Vellore.—Fort, is most intimately connected with the past history of this District : it is difficult to assign the antiquity of the whole or portions of it : the original Fort appears to have been on the summit of the adjacent hills, and it is not clear which Fort is referred to, in the old histories. On passing through the one entrance on the east side, the eye is attracted by the enormous blocks of granite, which form the high walls, and the carvings on the walls of the several gateways are worthy of notice. The principal object of interest is the ancient Pagoda, converted into an Arsenal. The carvings inside are very fine ; the roof of the shrine on the left of the entrance, is composed of large flags of granite, supported by groups of fine pillars, each carved out of one solid block of stone, and ornamented with open fret-work. At the door, stand two horses with riders, carved with much accuracy of design, and well finished. The mouth of one horse is open, and inside is a ball of stone, larger than the aperture of the mouth, and which has been cut from the solid block of stone. Passing in, on the left of the centre shrine, there is a well sunk to a considerable depth, the sides, faced with cut-stone : in this there is a stone door, which turns on a pivot, and admits one to a small square chamber, said to have been formerly used as a Treasure house. The gateway of the high Pagoda is lined with very high stone pillars, of one block of stone each, and the building consists of many stories, as shown by the small windows : flights of steps lead up to the top, but from the darkness and dirt from rats, bats, and pigeons, I imagine no one has reached the top for many years.

7. Wandiwash.—This old Fort where the French troops made a last rally against the English forces in 1760, has no buildings left in it at all : being a plantation of indigo within the walls ;

the winding entrance on the south side has portals of the large granite slabs and pillars, which appear immoveable by age. The Fort is an ordinary trace, with round towers at the four angles, and a deep wet ditch : the counterscrap not being revetted, except by loose rough stone a few feet above the water level, for the support of the high embankment above. There are the remains of masonry batteries erected above the old round towers, and at the south-east angle, a raised ravelin was thrown out evidently by European hands : these modern additions are, however, some destroyed and others rent from top to bottom, and will soon fall off into the ditch. The contrast is striking between these temporary defences, and the massive old walls in which the stones rest now, as they were laid without mortar, and showing no signs of displacement.

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From William Fraser, Esq., District Engineer, Coimbatore, to Lieutenant Colonel E. Lawford, Deputy Chief Engineer, Southern Circle, dated 21st December 1859, No. 224.

I have the honor to forward my memorandum on the Antiquities of the Coimbatore District.

2. I have delayed writing this memorandum, because, Indian Antiquities is a subject with which I am not acquainted—and I do not like to write about what I don't understand.

3. In saying this, I do not mean to imply that it is a subject in which we should not be interested ; because, apart from the fact of being ordered to do so, I believe that every Engineer should make himself acquainted with every thing connected with the District in which he works ; but, it is a subject requiring a good deal of thought and careful examinatian and comparison of the objects of antiquity themselves, and you are aware that since I took charge of the District, I have not had time, even if I had had the leisure, to accomplish this.

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MEMORANDUM ON THE INTERESTING MEMORIALS OF ANTIQUITY IN THE COIMBATORE DISTRICT.

The Memorials of Antiquity in the Coimbatore District, although

numerous, are not striking. The very ancient memorials consist of, so far as I have seen

I. Cromlechs,
II. Sepulchral Tumuli,
III. Pillar Stones,
IV. Stone Circles.

The memorials of more modern times are :—

I. Temples,
II. Forts,
III. Palaces,
IV. Rock Inscriptions,
V. Manuscripts.

2. As I am unacquainted with Indian Antiquities, I have designated these remains by the names given to similar objects in other countries. These names are probably correct, for no one who is acquainted with Celtic Antiquities can fail to be struck with the similarity between them, and the ancient remains scattered over this District.

### Cromlechs.

3. Some of the Cromlechs I have seen in this District are similar to those found in Ireland : three or more stones placed upright, and over them a large flat stone placed so as to form a small rude chamber.

I do not allude to the numerous small buildings of this type, formed with dressed stones, and generally having one or two figures of Hindu Deitiés carved upon them, but to those of a much ruder description, formed with unhewn stone, and without any carving or inscriptions.

4. In one respect these Cromlechs differ from those in the British Islands.

The latter are ruder in construction : the upright stones are often without any particular form, as if they intended merely to support the top stone.

The number of supports too, varies greatly, sometimes only three, sometimes six ; and thus the chamber is variable and rude in form.

The Cromlechs in this District are, on the contrary, formed with carefully selected flat stones placed on edge, so as to form a chamber nearly square ; and nearly completely enclosed.

The covering stones have not so decided a slope as have those of the Cromlechs of the British Isles.

5. Of unmistakeable Cromlechs, I *have seen* not more than six.

Four of these are in the valleys of the Báwani and Moyár Rivers ; and two in the valley of the Noyel River or the Bolamampatti Valley : one of the latter is close to the road from Coimbatore to Dambrapáleyam and about five or six miles from Coimbatore.

These two are remarkable for having, in a stone forming one side of the chamber, an oval shaped hole about 10 or 12 inches in diameter.

6. Major Hamilton when he visited the higher ranges of the Anamalais discovered a Cromlech precisely similar to those in the Bolamampatti Valley.

It is on the east side of, and about 400 yards from, the Tora Kádavu River, about three or four miles south of Ponachi.

I did not see this Cromlech, but having seen Major Hamilton's sketch and heard his description, I have no doubt but that it is a real Cromlech.

### Sepulchral Tumuli.

7. These are found in every part of this District—in the cultivated plains—in the lands that have been irrigated for hundreds of years—around the base of the Anamalais—in the deep gorges at the foot of the Nílgiris—and in the now untrodden unhealthy jungles in the valleys of the Bawáni and Moyár, I have found these Sepulchral Tumuli, with their Kist Vaens, Cinerary urns, and the other characteristics which distinguish the Tumuli that are scattered over Northern and Western Europe.

8. These Tumuli are not generally found isolated or singly here and there : in some places 10 or 12 acres are covered with them ; and these burial places are so close to each other, that it is impossible to resist the belief that the whole of the country

must, at one time, have been thickly peopled: it is scarcely possible that these could be the results of the occasional visits of a nomadic race.

9. By far the finest specimens of these remains, that I have seen, are in the valley of the Moyár.

Generally, the Tumuli are not much raised above the surface of the land; along the Moyár many of them are raised eight or nine feet and each Tumulus is surrounded by a stone circle.

10. In some places there is one Tumuli much larger than the rest, and surrounded by a larger circle of larger stones, flat, placed on edge, and standing about three feet above the ground.

11. In every instance there is a large flat stone upon the top of the Tumulus; in a very few cases I have seen two within one circle; and I presume each covered a Kist Vaen, as was the case in all, (perhaps 100) that I have seen open.

Some of the covering stones contained 150 to 200 cubic feet.

12. The Kist Vaens in these Tumuli are precisely similar to those found in Europe: from four to five feet in length and two to three in width; thus evidently intended for the reception either of Cinerary remains, or of bodies in a sitting posture: a mode of burial still observed by Lingadháris and others. The dimensions given above are those that generally prevail; but I have seen some much larger: there is a very large one in a rice field near Coimbatore close to the new road to the Railway Station: they are all, so far as I have seen, placed east and west.

13. I opened one of the Tumuli in the valley of the Moyár it contained the usual Cinerary urns of baked clay, with portions of calcined and uncalcined human bones—I have been told that pieces of metal have been found in some but I never saw any.

14. Very many Cinerary urns have been collected by the Railway Engineers, as their works laid open hundreds of Tumuli: the Collector of this District too, had and still has a considerable number.

They are of various shapes, and in size they vary from two or three feet to four or five inches in diameter: some are rudely ornamented, usually by wavy parallel lines; but none that I have seen

are in this respect equal to those in European collection: I once thought I had discovered a black *glazed* one, but, on closer inspection, I found that the polished surface had been produced by friction.

15. Of the origin of these Tumuli the same tradition is found in every part of the District. That they are the houses of a race of Pigmies called Pandúra, who, having angered the gods, were punished by fire rained upon them from Heaven: that they sought protection in their houses and pulled these huge stones over them.

16. The people have no veneration for these remains, not even the Erulars and Kurambers, who inhabit the jungles around the hills and who are so like the descendants of Aborigines. The only feeling they have about them is fear, that the spirits of the Pandúras might visit them if they interfered with their graves.

PILLAR STONES.

17. In a country where boundaries are still marked with Pillar stones, it may naturally be expected that this class of memorial would be numerous; such is the case in Coimbatore—Pillar stones, marking boundaries, are found every where.

Most of them are dressed stones. some are inscribed, and many have carvings of Hindu figures upon them.

18. Occasionally other Pillar stones are met with, which seem to have been raised to commemorate some gallant deed in the destruction of Tigers; as they are carved with representations of struggles between these animals and human beings. There are many of these throughout the District.

19. I found one half of an inscribed Pillar stone a short time ago in an irrigation channel near the base of the Anamalais: so far as we could make out the inscription, from the one half that was present, it was to the effect that a large tract of jungle had been granted to some person, by a Rájá who reserved to himself certain privileges: this inscription is evidently very old: I have directed search to be made for the other half.

20. All these Pillar stones are, however, comparatively modern; and have yet to exist for a few centuries before they become what is generally understood by the name: they are evidently of a date

long posterior to that of the Cromlechs and Tumuli : I have, however, met with Pillar stones which I consider coeval with those monuments of antiquity; rude, unhewn stones having an unmistakable family likeness to the Leagans of Ireland—the Hoar stones of Scotland and the Hoar stones of England.

21. In a thick jungle in the valley of the Kódangíri, a tributary of the Bawáni, there are two or three of these stones at a place called Kutirai Kuttu* Palam, and there is a good specimen about nine or 10 feet in height in the valley of the Bawáni near the village of Súndapatti.

22. In the valley of the Moyár near a place called Mángádu there are two

STONE CIRCLES.

23. These are found upon the Nílgiris ; they are, in some respects, similar to the ancient stone circles of the British Islands. That is, both are circular—made of unhewn stones—and, within both, Cinerary urns and bones are found.

24. They differ, however, in many points, the Nílgiri circles are smaller, being rarely more than eight or 10 feet in diameter ; and the walls are complete all round ; and are built up with several stones one over the other. The British and Irish circles are much larger, the walls are composed of single stones, and, in Britain, avenues of stones generally connect the circles together. These are altogether wanting in the Nílgiri circles.

25. It is true avenues are not found except very rarely in connection with the Irish circles, but they are always accessible through some opening.

26. The Nílgiri circles are, I believe, always upon the tops of the hills and the difficulty of getting large stones at, or up to such places might account for the differences noted above.

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* Note.—The " Kattu" here does not refer to *building*—but to *tying.* The Erulars who live near, say it is named from a tradition, handed down by their fathers, that a small band of predatory Horsemen who were skulking in this valley tied their Horses to these stones.

In an adjoining valley called Kalkattu Palam, there are about 20 Sepulchral Tumuli.

27. Upon the tops of most of the hills about Utakamand remains of stone circles may be seen—and I believe that few of the high hills are without some specimen of these remains : I regret to say that there is little now to be seen of them except *remains*, as on the whole plateau there are probably not more than five left unopened.

28. Had they been all opened by persons who felt an honest interest in such things—who would have recorded there whereabouts—the mode of opening, &c., and who would have lodged in the local Museum everything found within them, no one could object to their being opened : but it is to be regretted that many of them were opened either by people who had no better feeling than a morbid curiosity to see what was inside, or by those whose only wish was to send to England or elsewhere, whatever of interest they should discover.

29. In order to rescue those circles that then remained, I submitted to His Excellency the late Governor on his visit to the Hills a request, that an order should be made that no circle or Tumulis should be opened without the written permission of the Collector —and that an Officer of the Revenue or Public Works Department should attend, to watch and record the proceedings, and to see that the articles found were deposited in the Museum. I am not aware that any thing was ever done about it.

30. Beyond what Harkness in his work on the Nílgiris (page 32, *et seq.*) says, I am not aware what has been found in these circles : on this subject it is probable that Mr. Boswell of the Madras Civil Service, could give some information, as I understand he opened a good many of them.

31. Taking into account the fact that none of the inhabitants of the Nílgiris venerate these circles ; and that they give an account of their origin similar to that given of the origin of the Tumuli on the plains, I am disposed to think that the Sepulchral Tumuli below, and the Sepulchral circles upon the hills, are the work of the same people.

32. Upon the Nílgiris there are found stone cells that have been called Cromlechs, which they resemble in form : they are

small stone cells, always made of hewn stone, and sometimes carved with representations of Hindu Deities, hunting scenes, &c.

33. The most interesting of these are four near Mélúr on the south side of the hills : the four cells are connected, many of the stones are carved, and upon the back stone of the lowest cell there is an inscription in, I believe, Sanscrit, in Tamil and Canarese characters.

Round about these cells there are lying carved stones which appear to me to be decisive as to the comparatively modern and Hindu character of the whole

### Temples.

34. There are no fine Temples in this District : the best are at

Bawani.—where there are some very good stone equestrian figures.

Karur.—Contains nothing of particular interest.

Perur.—This Temple is within four miles of Coimbatore, and is well worth a visit on account of some very fine stone carvings in the Temple, and a small beautiful Tank outside : the Dwajāstambam is a very beautiful carved monolith.

The Gópuram of this Temple was twice struck by lightning ; the last time about 20 years ago, when the Gópuram fell : it is now being rebuilt.

35. Besides these three there are very many other Temples scattered throughout the District : many of them are in ruins—and with the exception of three cases (Pérúr, Karúr and Tirumalaikovil,) I am not aware of any effort being made either to preserve or re-construct them.

36. Up to a few years ago the revenues of the Temples were administered by Government Officers. They were then handed over to Trustees selected partly by the people, partly by the Collector, and there can be no doubt but that the revenues are now most dishonestly managed : the Temple establishments are not fairly paid, and the buildings themselves are allowed to go to ruin.

37. I am aware of the objections to the renewal of active supervision on the part of Government, but I believe that unless

some such supervision is exercised, the Temples will, in a few years, cease to exist.

38. Perhaps an annual scrutiny of the management and the accounts, might be resorted to with advantage so far as the buildings are concerned.

### Forts.

39. These are of two kinds : Forts in the plains and Hill Forts. The remains of Forts in the plains are very numerous :—indeed there were very few places of any importance, and very few Temples that were unfortified.

40. The principal Forts were on the lines of march from the Mysore country into Coimbatore—at the principal Passes on the Ambravati, the Cáuvery and the Báwani—and a few were the strongholds of the Pálegárs.

41. There were two principal Passes into Coimbatore from Mysore :—one by Cáuverypuram—and one by Gazelhutti.

42. On the first of these the principal Forts were :

1. Cáuverypuram—greater part of the walls still standing.

2. Chambali—walls of brick and stone. The bricks were lately sold to the Iron Company. The wall now demolished.

3. Bawáni—stone-walls still standing—the Temple and the Traveller's Bungalow are within the old walls.

4. Perindór—mud-walls, faced with stone—now demolished.

Near this Pass, at *Andiyúr*, the stone walls are still standing of an old Fort—the Temple is within the Fort.

43. On the Gazelhutti Pass the principal Forts were :

Tullamalai.—At the head of the Pass.

Gazelhutti.—A portion of which is still standing.

Danaikenkotta.—On the Bawáni near the junction of the Moyár. This was a large mud and stone Fort. It is now nearly demolished.

Sattiamangalam.—Also on the Bawáni ; a very important Fort, built of stone—the walls are still standing.

At Eród.—A very important Pass on the Cáuvery : there was a large and strong Fort : the walls are still standing.

44. The principal Forts on the passes of the Ambravutty River are

Karur.—A very important Fort enclosing the Temple : the walls have been entirely demolished.

Dárápuram.—A large mud Fort, some of the mud bastions only standing.

Kolambam.—A large Fort, and one of the last at which there was any fighting. It has been entirely demolished.

At Coimbatore there was a large Fort: it was demolished a few years ago—and some new streets built on its site.

At Pollâchi also there was a large Fort which was destroyed about ten years ago.

### Hill Forts.

45. The most interesting of these is Bagásuran Kotta—better known as the Drûg. It is on a high point of the Nílgiris on the south side of the Kúnûr Valley.

Another Fort on the Nílgiris is Mâle Kotta near Kulhutti.

In the valley of the Moyár near a place called Attiltorai, there is a Fort upon the top of an isolated hill rising about 1,500 feet above the valley: it is almost inaccessible.

Near the village of A'namal and upon the top of a small hill, called Jain-Kal-Drug, there are some lines of fortification.

Upon a high conical hill near the Ambravati river—and near the Fort of A'namalais there is a Fort called Chakragiri Drúg.

46. All these hill Forts are, I believe, in a condition very little different from that in which they were left by their last occupants ; but the only one I have examined is that near Anamalai.

They are not likely to suffer from any hand except that of time.

### Palaces.

47. The only Palace in this District is that of Coimbatore. In nothing is it a Palace except in name.

The outer walls enclose an oblong space divided into two small Courts, with small dark rooms on only two sides.

The outer walls are brick and mud—the inner walls are mud alone—there is some dressed stone in the plinth—and some short posts of beautiful teak supporting the roof.

A considerable portion of the roof has fallen in—and so have many of the mud walls.

Up to a month ago it had been used as the Tahsildar's Kachèri—but has been abandoned as unsafe. It is not worth preserving.

ROCK INSCRPTIONS.

48. I have met with but one, near Anamalai: it is cut in a flat rock, which, up to the time of my seeing it, had been used by the villagers to beat out grain upon.

49. It is in old Tamil, and to the effect that, a certain quantity of land had been granted for the support of the Anamalai Temple; and pronouncing anathemas against any one who should deprive the Temple of those lands. The Temple was demolished by Tippu, who I suppose by appropriating the lands earned the anathema in full.

By beating grain upon it a portion of the inscription has been destroyed.

I directed a low wall to be built around it.

MANUSCRIPTS.

50. This is a most interesting subject to the antiquarian and one to which, so far as I am aware, very little attention has been paid in this country: almost every Temple, town and river, has its Puranam; and although they contain a very large proportion of fable, they have facts enough to make them worth collecting.

51. I have received, as yet, but two; one only, have I been able to get copied: it is the song or story of Anamalai.

52. I have been promised seven or eight more, and if the Chief Engineer considers them of much interest, I will have them copied and translated for the next Antiquarian Report.

DISTRICT ENGINEER'S OFFICE,
COIMBATORE,
21*st December*, 1859.

(Sd.) WM. FRASER, C. E.,
*District Engineer, Coimbatore.*

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ORDER THEREON, 19th April 1860, No. 803.

With this letter the Chief Engineer submits in pursuance of the Order of the 3rd June 1857, No. 1,060, the reports furnished by

the Engineers of the five Districts named in the margin, on the Ancient Architectural Remains in their respective ranges for the official year 1858-9.

Ganjam. North Arcot.
Nellore. Coimbatore.
Cuddapah.

2. The Government authorize the execution of the experiment proposed in paragraph 2, viz. the application of Ransome's Patent Process to the preservation of the Inscriptions on the Rock near Naugám in the Ganjam District.

3. Government have read with interest the short report furnished by Captain Mullins on the Udiagiri Fort. They would be glad if a more detailed one could be prepared when opportunity occurs, and the question of its suitability as a sanitarium might be discussed ; the advantages and disadvantages in that respect being stated at length. The abolition of the office of Government Photographer renders it impossible to accede to Captain Mullins' request that views should be taken on the Drúg.

4. It does not appear necessary that Government should take the initiative in the matter alluded to in paragraph 4 of Colonel Bell's letter.

5. The Governor in Council approves of the proposal for restoring the wall round the burial ground at Arni. The Chief Engineer will adopt means to prevent for the future such depredations as Captain Prendergast mentions. A simple slab as proposed may be erected. After a detailed Estimate of the repairs necessary for the preservation of the Chendragiri palace has been prepared, it may be submitted, when Government will take the question into consideration.

6. Mr. Fraser's paper on the Cromlechs, Sepulchral Tumuli, &c. of the Coimbatore District is of much interest. Government fully agree with Colonel Bell in his remarks upon the way the District Engineer has performed the task assigned him ; and they request that the translations of the manuscripts alluded to, may be obtained, and forwarded to them with the next Annual Report.

7. Copies of Colonel Bell's letter and its enclosures will be furnished to the Literary Society for publication in their Journal.

(True Extract.)

C. G. Master.

*Dy. Secretary to Government.*

*Report on the Ruins of Gairsoppah.* By LIEUTENANT W. S. DREVER, *Executive Engineer.*

To

THE DISTRICT ENGINEER OF CANARA,

SIR,

I have the honor to report that I have now cleared a sufficiency of the jungle in the vicinity of the ruined city of Gairsoppah to enable me to form a tolerably correct idea of the nature and extent of these interesting relics of the past.

2. They may be shortly divided into two classes—1st, those appertaining to the city; and 2nd, those belonging to or forming a part of the temples or other religious buildings.

3. The ancient city of Gairsoppah was situated on the left bank of the river of the like name, about 1 mile above the village of Gairsoppah of the present day.

4. Its present remains extend over an area of about $1\frac{1}{2}$ square mile. I have utterly failed to discover the slightest trace of architecture in the city itself: the houses were built of rough stone in mud, and in the construction of their private dwellings their owners evidently thought more of cheapness than durability.

5. At the south western boundary of the city, tradition points out all that remains of the "Queen's Palace", and even goes so far as to tell us that on this particular spot stood her Majesty's throne the legend being somewhat verified by the fact that two large granite slabs having some huge monster carved on them, and looking upwards, severally support the sides of what might once have been steps leading to the seat of royalty, but beyond these two slabs I have met with nothing in the city or palace to warrant any further outlay in search.

6. There is however one most marked peculiarity in the city; nearly every 20 or 30 yards one comes across a well, and some of them are still in excellent preservation, especially those that were bricked or faced with stone, but the strange part of these wells is

that they all communicate at the bottom by an uniform segmental cutting of about 3' by 2'—As soon as I saw this it struck me that the wells must have been filled from the river, by bunding it high enough up to command the highest well, and on enquiry of the " oldest inhabitant", this turned out really to be what he and traditionary lore had to say in the matter.

7. I much regret not finding any trace of this ancient anicut, but its component parts have long ago parted and left not a wreck behind.

8. We now come to class 2, or the religious buildings; and their remains indeed form the only really interesting feature in the case.

9. They consist of one large temple still in tolerable condition and numberless other smaller oratories in various stages of decay.

10. The architecture of the large temple is excessively massive in its proportions yet exceedingly chaste and delicate in its details.

11. Under its (once no doubt resplendent) dome there now as in days of yore sit on one pedestal, four large and finely carved idols each holding the lotus in the palm of his hand, and therefore I presume the Buddhist deities.

12. These four were evidently *the* presiding gods of the temple, and the calm majesty with which the sculptor has invested them, renders them worthy of their high estate.

13. There are a great number of niches or petty shrines both inside and outside the walls of this temple and each at one time contained its little carved idol, these however together with all that was worth stealing or capable of being removed, have been seized by the Brahmins of a neighbouring temple, who state that though it be true that the idols, &c. originally belonged to the " Chutter Muck" (as they call the large temple) yet as they have been in *their* temple for years and years, they have become *their* property and they don't intend to give them up. I must therefore leave that matter to be settled by higher authority. The stone of

which the large temple is built is grey granite, and the idols seem to me to be carved out of hornblende or some such hard material, but I cannot give much of an opinion on such a matter.

14. The different oratories or subsidiary temples are very numerous, and in nearly all are there idols more or less elaborately carved, generally one to each shrine.

15. Some of these carvings are the finest I have ever seen in stone, the God is generally standing, with an elegantly cut canopy over his head, and the detailed execution of some of these canopies (idol block, and canopy being all one piece) is really astonishing.

16. I have brought several inscription slabs to light, and I am now getting one brought down to Honore by water so that I may have it deciphered if possible by some Pundit, and if this cannot be done I will have a tracing made.

17. What I now wish to know is whether or not the Government are desirous of having any of the images sent to Madras or to Bombay to be placed in the Museums, or if they wish me to collect the now scattered images and arrange them in and about the Chutter Muck.

18. If left as they now are they will in time of course disappear; but if I am ordered to remove any of them I request the Brahmins in the temple there may be cautioned to offer me no obstruction, or they will to a certainty claim everything as their own.

19. I have not yet found any coins, but I shall still endeavour to do so.

20. Some of perhaps the best idols are much too heavy for removal and the only way to manage with them is to have them photographed, if this could be managed without much trouble; but if any photographer *be* sent he should come at once, for the rains are not now far off.

21. I have only further to observe that it is quite impossible to arrive at any conclusion as to the origin or cause of decay of this city from enquries now instituted; we must decipher the old in-

scriptions or we shall learn nothing, for tradition at one time tells you it is a Jain temple contemporary with the Tower of Babel, and at another blandly states, it was inhabited and governed by a Queen 150 years ago.

I have the honor to be, &c.,

COOMPTAH, 23rd *February* 1859. (Signed) W. S. DREVER, Lieut. *Executive Engineer.*

True copy.

(Signed) J. N. HUNTER, *Acting District Engineer of Canara.*

True copy.

W. H. HORSLEY, Lieut. Colonel, *Chief Engineer.*

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## XIII.—*Public Works in Travancore.*

POLITICAL DEPARTMENT.

PROCEEDINGS OF THE MADRAS GOVERNMENT.

Read the following letter from FRANCIS N. MALTBY, Esq., Resident of Travancore and Cochin, to T. PYCROFT, Esq., Chief Secretary to Government, Fort Saint George, dated 26th June 1860, No. 38.

1 have the honor to report, for the information of His Excellency the Governor in Council, that Mr. Collins, appointed Civil Engineer to the Rajahs of Travancore and Cochin, assumed his duties at Cochin on the 17th April last, and, after a short tour in the Cochin State, joined me at Trevandrum on the 16th ultimo.

2. As it is of much importance that the Madras Government should be kept fully informed of the progress of the Public Works of these States, I have the honor to lay before them, the following statement of the plans which will first occupy Mr. Collins' attention.

3. I have first to allude to the works which Mr. Collins found already in progress at the Port of Allepey, under the charge of Mr. Crawford, the Commercial Agent.

4. Allepey is the Commercial capital of the State of Travancore, and already possesses a very considerable trade. Though not enjoying the advantages of any land-locked harbour, it is still well suited to commerce. The town is situated on the sand-bank, which separates the large estuary of Cochin from the sea, and a Canal cut from the backwater through the heart of the town, conveys the produce of the interior to the doors of the Merchants' stores, and within a furlong of the sea.

5. But the principal advantage of the Port of Allepey is its remarkable mud-bank, which renders its open roadstead a safe harbour of refuge throughout the whole of the South West monsoon. However this remarkable phenomenon may be accounted for, it is a fact, that in the stormiest weather of the South West monsoon within the influence of this bank, there is still water at sea, and so little surf on shore, that boats can land at all times, and the landing and shipping of cargo can be carried on throughout the monsoon.

6. The general theory is that the soft, almost fluid, mud yields to the pressure of the great waves and prevents their rising above the ocean level.

7. However this may be, this provision of Providence affords to this Coast a safe harbour of refuge, and it is only to be regretted that it is so little known.

8. I am informed that in a book, nearly two hundred years old, the voyages of Captain Cope Allepey, is alluded to in a way which proves that its advantages were then known and appreciated. It is spoken of as "mud bay," and described as one of the most extraordinary harbours in the world. But subsequently, probably in consequence of the disturbed state of Travancore, the trade of Allepey declined, and the Canal dug by a former Sovereign of the country was at the beginning of this century almost entirely choked up (see Colonel John Munro's early reports) and the advantages of "mud bay" have been greatly lost sight of.

9. But within the last few years the trade has been considerable, and the annexed list of vessels which in the last 5 years have taken out Port clearances in the months of June, July, August and September (the 4 months during which the coasting trade is in abeyance at other Ports of the coast) proves that the advantages of the Port are again beginning to be appreciated.

10. But in order that the shipping may derive full advantage from the refuge afforded by the bank, a conspicuous Light-house and a light of sufficient power to penetrate the haze of the monsoon are required. The present Flagstaff cannot in hazy weather be distinguished from the Cocoanut trees, and the lantern exhibited upon it is of insufficient power; while vessels which fail to find the bank are on a dangerous lea shore.

11. Mr. Crawford the Commercial Agent has long urged the necessity of this work, and General Frederick Cotton, who lately visited the Port, was so much struck by its adaptation to what has been so long sought for, a harbour of refuge on the Malabar coast, that he strongly recommended that no time should be lost in building a Light-house.

12. This highly important work has been sanctioned by His Highness the Rajah of Travancore, and the foundation is already laid. The Canals are also being extended; and a Railway is being laid down from the Canal to the sea side. This will, if practicable, be carried on a small jetty into the sea, but there is some doubt whether the muddy bottom admits of this. Some peculiar action is going on under the sea. At times huge cones of liquid mud are forced up in the sea near the shore, and this is accompanied generally by a subsidence of the sand near the waters edge to a dimension equal to the bubble or cone of mud. It is therefore very doubtful whether a jetty could be laid without the piles being undermined by these changes in the mud-bed.

13. These works will however make the port of Allepey a convenient shipping port in immediate connexion with the inland water communication, which forms so important a feature of this country.

14. The commencement of these works is due to the energy of

Mr. Crawford ; they will now be carried on under his superintendence, guided by the professional skill of Mr. Collins.

15. One of the first works to which Mr. Collins' attention has been directed is the construction of a Bridge over the Ponany river, in order to bring the Northern portion of the State of Cochin into connexion with the Madras Railway. The Rajah of Cochin had expressed to me his readiness to sanction the expense necessary for this Bridge, and for a road to Trichoor, an important trading place at the head of the navigation of the Trichoor Lake. Mr. Collins has fixed upon a site for the Bridge close to the Railway Station, and has found the intervening country from the river to Trichoor (20 miles in length) very favorable for a road or Railway. Plans will be prepared for a Bridge on the Railway level, and a survey of the country is already in progress with a view to constructing a road on such a plan, that all the drains and culverts shall be suited to a Railway, should one eventually be laid down.

16. By this arrangement a traveller from Madras by the Railway will only have to drive over these 20 miles to embark on the inland navigation which extends, with one interruption only, to Trevandrum, touching at the important stations of Cochin, Allepey and Quilon.

17. To overcome the one interruption alluded to, and to extend the communication from Trevandrum to Cape Comorin, are the works which are now occupying Mr. Collins' attention ; and carefully prepared plans and sections executed in 1828 by Lieutenant now Colonel) Green, when Colonel Morison was Resident, afford the necessary means of studying the subject.

18. The interruption at Vurkullay is caused by a laterite hill having a base of 4 miles, and rising to 180 feet. Of the base, three miles, one and a half on each side, consist of terraced rice fields rising from the backwater to an elevation of 93½ feet.

19. I believe that the measure adopted will be to shorten the interruption by a Canal of one mile on each side, and to reduce the hill by a cutting of 80 feet over the intervening space of 2 miles, a Railway will be laid having a gradient of 30 yards to the mile or 1.58. Over such a Railway, on suitable trucks, the Canoes used in this country with their cargoes can be easily drawn.

20. The advantage of this plan is, that it is so much work done towards a thorough Canal, and there is no doubt of its being even in this imperfect state highly remunerative. The contractor now pays 10,000 Rupees a year for the right of conveying goods from one backwater to the other, and with such increased convenience the trade will largely increase. Trucks pushed by coolies up the incline, and going down by their own weight will rather expedite than retard the traveller by the backwater.

21. It is probable that eventually a tunnel will be found more practicable than an open cutting.

22. The construction of a Canal from Cape Comorin to Trevandrum has just been commenced by His Highness the Rajah, and, in honor of the Queen of England, it will be called the "Victoria Canal." It can be brought at a moderate cost to within seven miles of Trevandrum, where a series of granite rocks and laterite hills offer serious obstruction. Over this portion some such expedient as that described above must be resorted to ; but if the rice and salt of the south are brought to within seven miles of Trevandrum and the whole line of water communication from Cape Comorin to the Railway is complete, with the exception of two short porterages, the trade will probably be developed to a degree which will warrant the expensive works necessary to render the water communication complete.

23. To open out the interior of the country, roads striking off from the backwater are required. Three of these have been planned ; one from Trevandrum to a Sanatarium on the mountains due east and so to Papanassum ; one from Kotyam over the mountains to Dindigul, and one from the Cochin backwater to join the road under construction from Polachy to the Anamullay forests. Of these the two former have just been commenced.

24. A thorough repair of the southern road from Trevandrum to Tinnevelly is also about to be commenced.

25. Two other subjects connected with the backwater are also engaging Mr. Collins' attention.

26. The first is a series of columns with lights to guide the craft to the entrances of the rivers and Canals. The want of such

assistance is much felt, and His Highness being desirous of erecting a monument within his territories to the memory of the late General John Munro has resolved to dedicate these columns and lights to that purpose.

27. The second is the improvement of the drainage of the land in the Trichoor Lake by substituting for the desultory and uncombined efforts of the Natives, a series of drains scientifically laid out; and for the wheels worked by human power the mechanical application of wind or steam. At present the valuable cultivation of the Trichoor basin is periodically destroyed by floods, whereas there is no doubt that the application of science will not only render the present lands secure, but also recover a considerable extent of additional land.

28. To this important subject Mr. Collins brings a valuable fund of Engineering knowledge.

29. In laying before the Government of Madras this sketch of the principal works required for these Territories, and which I hope will be actively carried on, I need hardly call their especial attention to the fact, that the bringing of the Madras Railway to the head of the Trichoor Lake will enable the important harbour of Cochin to compete for the trade of Coimbatore and the Neilgherries in Cotton and Coffee and I believe that its great natural advantages will become very conspicuous. The port of Cochin in the fair season and Allepey in the South West monsoon, when connected by an efficient inland navigation, connected again with the Madras Railway, possess advantages which I believe no artificial means can give to any other ports on the coast, and it is for this reason that I have thought it desirable to lay the above summary before the Government, at a time when the shortening of the communication between England and Calcutta by a route across this Presidency is under consideration.

P. S.—Since the above letter was drafted, I have received a very interesting communication from Mr. Crawford on the subject of the Allepey backwater, which I have the honor of annexing. A copy will be sent to Mr. Collins,

No. 201, dated the 20th Instant.

who will I am sure afford Mr. Crawford his assistance, in explaining the remarkable phenomena which Mr. Crawford describes.

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*Extract from Hamilton's account of the East Indies in Pinkerton's Collection of Voyages and Travels,* (1678 to 1723.)

Mud-bay is a place, that, I believe, few can parallel in the world; it lies on the shore of Saint Andrea, about half a league out in the sea, and is open to the wide ocean, and has neither Island nor bank to break off the force of the billows which come rolling with great violence on all other parts of the Coast, in the South West monsoon, but on the bank of mud, lose themselves in a moment, and ships lie on it, as secure as in the best harbour without motion or disturbance. It reaches about a mile long shore, and has shifted from the northward in 30 years about three miles.

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A MS. note has the following remark :—This singular accumulation of mud still exists and still affords the same convenience for anchorage in the worst weather. The present account was published in 1723 and now in 1825. The mud bank has shifted from Saint Andrea in N. Lat. 90° 40' to Poonangonot in N. Lat. 9° 25' being 15 miles in 102 years.

The mud bank now (1860) is in Latitude 90° 28' 30."

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From HUGH CRAWFORD, Esq., Commercial Agent at Allepey, to FRANCIS N. MALTBY, Esq., British Resident of Travancore, Trevandrum, dated 20th June 1860, No. 201.

I have the honor to acknowledge your letter, No. 988 of the 16th instant, and have in accordance with your directions affixed a note to each Chart of the Roads of Allepey, that the soundings are in feet not fathoms.

Lieutenant Taylor attributes smoothness of the water to the soft mud at the bottom, which when "stirred up by a heavy swell

from seaward the activity of the waves is so deadened as to render the shore line free from surf." I regret never having met Lieutenant Taylor.

A number of years ago, I brought to the notice of General Cullen, that the perfect smoothness of the water in the roads and at the beach at Allepey, was attributable, not to the softness of the mud at the bottom, so much as the fact of the existence of a subterranean passage or stream, or a succession of them, which communicating with some of the rivers in land and back water become more active after heavy rains, particularly at the commencement of the monsoon, than in the dry season, in carrying off the accumulating water, and with it vast quantities of soft mud. General Cullen the Resident sent a quantity of piping and boring apparatus in order to test the existence, or otherwise of what I had urged. Accordingly, I sunk pipes about 700 yards east from the beach and at between 50 and 60 feet depth; and after going through a crust of chocolate colored sand-stone, or a conglomerate mixture of that and lignite, the shafting ran suddenly down to 80 feet, fortunately, it had been attached to a piece of chain or it would have been lost altogether. Several buckets from this depth were brought up which corresponded in every respect with that thrown up by the bubbles as they burst at the beach, which I shall here try to describe as accurately as I can. Due west of the Flagstaff and for several miles south, but not north of that, the beach will after, or during these rains, suddenly subside, leaving a long tract of fissure varying from 40 to 100 or 120 yards in length, the subsidence is not so quick at first, but when the cone of mud once gets above the water the fall is as much as 5 feet in some instances, when the cone bursts, throwing up immense quantities of soft soapy mud, and blue mud of considerable consistence in the form of boulders, with fresh water, debris of vegetable matter, decayed, and in some instances green and fresh. These bubbles are not confined to the seaboard, but are, I am inclined to think, both more active and numerous in the bed of the roads with the Flagstaff bearing from E. N. E. to the South, until it bears N. E. by N., or even South of that. About five years ago for about 4 miles down the coast and from the beach out to sea for a mile and a

half, the sea was nothing but *liquid* mud, the fish died, and as these cones reared their heads above the surrounding mud they would occasionally turn over a dead Porpoise* and numerous other fish; the boatmen had considerable difficulty in urging their canoes through this to get outside of it, the beach and roads presented then a singular appearance, nothing to be seen but those miniature volcanoes, some silent, others active, perfect stillness of all around the ships in the roads as if in some dock, with a heavy sea breaking in 7 fathoms outside.

* Porpoises are very numerous in the backwater.
F. N. M.

There are numerous deep holes, some of them I measured in 1852, one in particular just at the end of this canal had as much as 60 feet in depth, these holes may, or may not communicate directly with the roads, but I think it will be found that the principal source of active communication, is more inland, and the backwater perhaps only an auxiliary. About 3 miles above Chenganoor in the river of that name, there is one or two deep "Linus," which I only had an opportunity of visiting twice; the first time, I had not the means of ascertaining the depth, the next I lost both lead and line.

The depth of this passage is not so great as you approach the beach as noticed above, for while extending the Canal from the Timber Depôt in March last, about 200 yards from the beach at 12 feet, we suddenly and unexpectedly broke through the sub stratum when a column, fresh water, mud and vegetable debris, and about 9 inches in diameter, spouted up, which when left alone, gradually subsided as the upper stratum of sand filled in round the column of the spring.

I submit the above information as I feel that it will be interesting both to yourself and Government, to pursue the investigation of this subject more efficiently. I have omitted to state one important particular, that is, should *no* rain fall, as has been the case this year, the sea in the roads and at the beach is not *nearly* so smooth; up to this time we have had none of the mud cones bursting at the beach, neither in the roads, as the waves tumble in perfectly clear; there was a heavy surf from the 26th ultimo to

9th instant, but never in any instance for these last 11 years has the rain held off so long as in this, and the roads and beach have always by the end of May been perfectly smooth. To illustrate the perfect smoothness of the roads after the monsoon has fairly set in, a ludicrous event which occurred two years ago, will suffice. During a heavy westerly gale of wind in May 1858, a ship had to call at Allepey for Pepper bound to London, the Captain who had been frequently here before, sighted the light at midnight, and ran from the heavy sea into the smooth water of the road, the small sail they had set was soon stowed and the anchor got ready, the Leadsman being told to report when he got into 4½ fathoms, time elapsed, and considering the strong gale that was then blowing right on to the shore, the ship should have been in that water long before, but to every enquiry of the Captain " 6 fathoms" was reported, uutil he took the lead line in his own hand, and discovered for the first time, that the ship was aground ! the anchor was let go, and notwithstanding the distance she had over-run she swang at once to the wind, and remained all night until the next afternoon when the wind drawing more to the northward she made sail and stood out to the proper anchorage, remaining there, as she did when aground, still as in the London docks.

The fall of rain up to this time is only 7 9-10th inches since April and from the 1st of January 13 inches only.

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ORDER THEREON, 14th July 1860, No. 426.

1. The Resident of Travancore and Cochin reports that Mr. Collins, appointed Civil Engineer to their Highnesses the Rajahs of the two States, assumed charge of his duties on the 17th April last. Mr. F. Maltby gives a sketch of the works which are under execution or in contemplation under Mr. Collins' supervision.

2. These are :—

1st.—The construction of a Light House at the Port of Allepey, the extension of the Canal from the backwater to the Town, and the laying down of a line of Railway from the Canal to the Sea side. These works in progress. Mr. Maltby adverts to the peculiar circumstances of the Port of Allepey which render it a perfectly safe harbour throughout the South West Monsoon, and he

forwards an interesting letter upon the subject from Mr. Crawford the Commercial Agent to His Highness the Rajah.

2nd.—The construction of a Bridge over the Ponany River in order to bring the Northern portion of the State of Cochin into connexion with the Madras Railway, and of a road thence to Trichoor an important trading place at the head of the navigation of the Trichoor Lake. His Highness the Rajah of Cochin has expressed his readiness to sanction the expense of both these works. The site of the Bridge, close to the Railway Station, has been fixed on. The intervening country between the River and Trichoor (20 miles) has been found to be very favorable to a road or Railway, a survey is already in progress with a view to constructing a road on such a plan, that all the drains and culverts shall be suited to a Railway, should one eventually be laid down.

3rd.—The construction of a Canal, to be called the Victoria Canal, from Cape Comorin to within 7 miles of Trevandrum from which there will be a portage to Trevandrum. This Canal has been commenced by His Highness the Rajah.

3. It is further in contemplation to overcome, as far as possible, the only interruption in the inland navigation between Trevandrum and Trichoor, via Quilon, Allepey and Cochin, or that at the Vurkullay hill by extending the present Canals for one mile on each side of it, cutting down the hill to the extent of 80 feet for the intervening two miles and having a Railway for that distance. Over such a Railway, on suitable tracks, the Canoes used in this country with their cargoes can be easily drawn, a similar expedient will probably be adopted for the portage from Trevandurm to the head of the Victoria Canal above alluded to.

4. Roads striking off from the backwater to open out the interior of the country.

1st.—From Trevandrum to the mountains due east and so to Papanassum.

2nd.—A road from Cotyam over the mountains to Dindigul. These two have just been commenced.

3rd.—A road from the Cochin backwater to join that under construction from Polachy to the Anamually forests.

4th.—The southern road, from Trevandrum to Tinnevelly is also about to be thoroughly repaired.

5. The erection of a series of columns with lights to guide the craft to the entrances of the Rivers and Canals. The want of such assistance is much felt and His Highness being desirous of erecting a monument within His Territories to the memory of the late General John Munro has resolved to dedicate these columns and lights to that purpose.

6. The improvement of the drainage of the land in the Trichoor Lake. These two last subjects are engaging Mr. Collins' attention.

3. His Excellency the Governor in Council has received with high gratification this list of works of public utility undertaken or projected by their Highnesses the Rajahs of Travancore and Cochin. The energetic prosecution of these works cannot but redound greatly to the honor of those Princes, and will be of the utmost benefit to their subjects. The Resident will communicate these sentiments to the Rajahs. Mr. Maltby's report will also be forwarded to the Right Honorable the Secretary of State for India whose attention will be called to the laudable exertions being made by their Highnesses for the improvement of their Territories.

4. A copy of Mr. Maltby's report and of its enclosure, Mr. Crawford's letter on the Port of Allepey, will be furnished to the Madras Literary Society.

(True Extract.)

T. PYCROFT.
*Chief Secretary.*

# SCIENTIFIC INTELLIGENCE.

*Earthquake in the District of Salem.*

## PUBLIC DEPARTMENT.

## PROCEEDINGS OF THE MADRAS GOVERNMENT.

Read the following letter from H. G. SMITH, Esq., Sub Collector of Salem, to T. PYCROFT, Esq., Chief Secretary to Government, Fort Saint George, dated Admoncottah, 4th March 1861, No. 50.

I have the honor to report to you the occurrence of rather a severe shock of an earthquake felt here at 11.22 A. M., this day. The ground of my encampment undulated considerably, and the shock lasted for about a minute. I have heard of no accidents from it.

Its direction was from north-east to south-west.

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ORDER THEREON, 11th March 1861, No. 352.

Communicated to the Madras Literary Society and to the Government Astronomer for information.

(True Extract.)

T. PYCROFT, *Chief Secretary.*

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PUBLIC WORKS DEPARTMENT.
*Public.*

## PROCEEDINGS OF THE MADRAS GOVERNMENT.

Read the following Proceedings of the Board of Revenue, dated 12th March 1861, No. 1,380 :—

Read the following letter from H. A. BRETT, Esq., Collector of Salem, to J. D. SIM, Esq., Secretary to the Board of Revenue, Fort Saint George, dated Moganoor, 8th March 1861, No. 35 :—

SIR,

1. I have the honor to enclose for the information of the Board, the copy of a communication received from Mr. Boalth, Special Deputy Collector, reporting that an Earthquake took place on the Shevaroy Hills, on Monday the 4th instant.

2. The District Engineer also informs me that a shock which lasted, perhaps half a minute, was felt in the town of Salem at about 11-30 A. M. on the same day.

From Mr. W. Boalth, to H. A. Brett, Esq., Collector of Salem, dated Shevaroy Hills, Moondambady, 4th March 1861.

Sir,

1. I beg to inform you that there was an Earthquake this forenoon on the Shevaroy Hills at half-past 11 A. M. The weather was clear and calm, only two or three specks of white clouds were fixed in the atmosphere. There was no breeze. The sun was powerful. A noise like a continued thunder was heard to proceed from under ground travelling due north to south. I had a Prismatic compass and ascertained the points.

2. The shock continued for about 15 seconds. My Office building shook. People ran out to ascertain the cause, and were surprised to find it was an Earthquake. An hour after, the shock was repeated in a parallel line, about half a mile from the place at which I put up in Moondambady.

3. I heard from Mr. Brown, a Planter on the Hills, that according to his Diary, similar Earthquakes took place last year; two on the night of the 17th January, and one at 7 A. M. on the morning of the 20th.

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Submitted for the information of Government.

(A true Copy and Extract.)

J. D. Sim, *Secretary.*

Order thereon, 16th March 1861, No. 532.

Ordered to be communicated to the Literary Society, and the Government Astronomer.

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Public Works Department.

*Public.*

PROCEEDINGS OF THE MADRAS GOVERNMENT.

Read the following Proceedings of the Board of Revenue, dated 27th March 1861, No. 1,606 :—

Read the following letter from H. A. Brett, Esq., Collector of Salem, to J. D. Sim, Esq., Secretary to the Board of Revenue, Fort Saint George, dated Námakkal, 19th March 1861, No. 41.

Sir,

I have the honor to forward for the information of the Board, a statement showing the places in which the earthquake alluded to in my letter of the 8th instant, No. 35, was felt in different parts

of the Salem District, according to reports received since the date of the above letter to the Board.

*Statement showing the several places at which the shock of an Earthquake was felt in the Salem District, on the 4th March* 1861.

| Táluq. | Village. | Points. | Date. | Hour. | How many minutes lasted. | Remarks. |
|---|---|---|---|---|---|---|
| | | | 1861 | | | |
| 1. Darampoory | Admoncottah............ | N E to S W | 4 Mar. | 11-22 A M | About 1 minute. | The ground undulated considerably. |
| Do. | Pennagaram Division and adjoining country...... | Do. | Do. | 11 A M | Not stated. | |
| 2. Tripatúr.... | Cusbah of Tripatúr........ | N to S | Do. | 11-30 A M | Do. | |
| | Coratty Selvarumputty Sevathoor & Vengalapuram. | W to E | Do. | 11 A M | Do. | |
| 3. Trichengód . | Coothumpoondy and other villages of the Táluq including villages in the Senkaridrúg Division .. | E to W | Do. | 11 A M | Do. | |
| 4. Kistnagherry | Cusbah of Kistnagherry & other places ........... | ...... | Do. | 11 A M | Do. | |
| 5. Salem...... | Town of Salem........... | N to S | Do. | 11 A M | Do. | The noise was like that produced by a running carriage. |
| Do. | Shevaroy Hills.......... | N to S | Do. | 11 A M | 15 Seconds. | Noise like continued thunder was heard to proceed under ground. |
| 6. Ootengiri. .. | Hurroor..... ...... .... | ...... | Do. | 11 A M | .............. | The tiles of an old house fell to the ground from the shock. |

SALEM, COLLECTOR'S OFFICE ON CIRCUIT, NAMAKKAL, 19*th March*, 1861.

(Signed) H. A. BRETT, *Collector*.

Submitted for the information of Government.

(True Copy and Extract.)

(Signed) J. D. SIM, *Secretary*.

ORDER THEREON, 6th April 1861, No. 683.

Ordered to be communicated to the Literary Society and the Government Astronomer in continuation of the Proceedings of Government dated 16th March 1861, No. 532.

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## *Cultivation of Tea.*

REVENUE DEPARTMENT.

### PROCEEDINGS OF THE MADRAS GOVERNMENT.

Read the following letter from H. CLEGHORN, Esq., M. D., Conservator of Forests, to J. D. BOURDILLON, Esq., Secretary to Government, Revenue Department, Fort Saint George, dated Madras, 11th August 1860, No. 96 :—

SIR,

1. With reference to the Order of Government, dated 9th November 1859, No. 1,531, Revenue Department and Proceedings of Government, dated 25th July 1860, No. 30, Revenue Department, I beg to state that I have found it impossible, owing to my other engagements, to visit the Tea plantations at Caldoorty and Udagiri mentioned by General Cullen, in his letter to the Chief Secretary, dated 27th October 1859.

2. I regret this, as the vegetation of that part of the Travancore territory is most luxuriant, and the lofty ranges stretching towards the Pulnies have been less explored than any other part of the Malabar Ghâts.

3. I have collected from my journal a few notes made during my tours upon the Tea plants seen in different Districts of the Presidency.

*Localities where Tea Plants are growing.*

I. SHEVAROY HILLS.—There are several well grown trees at Yercaud, introduced by G. Fischer, Esq., these have not been picked or pruned, and, indeed, have been left to nature, but are growing vigorously nevertheless.

4,000 feet.

II. COORG.—A case of plants was brought from China by Colonel (Lieutenant-General) Dyce in 1843; these (now trees) appear to me *over luxuriant* producing a rapid growth of leaves and not bearing seed with regularity.

4,500 feet.
Rain fall 120 In.
M. Temp. 68.°

III. NUNDIDROOG.—A number of plants have lately been sent to this Hill Sanatarium, they were beginning to droop in the Lál Bágh Garden, Bangalore, but there is hope of their thriving in their new location. "The mean temperature of Bangalore is 75°, and the average rain-"fall 35 inches." The climate being too dry and too hot, the plants necessarily become dwarfed.

4,800 feet.

IV. BABABOODEN HILLS.—Four plants from General Dyce's stock were received from Mercara in 1847, these grew well without care. A packet of fresh China seeds was sent last year; Colonel Porter, Superintendent of Nuggur, raised 23 plants above Ghát near the Sircar Bungalow, and a number of seedlings have been planted out about a thousand feet lower by Mr. Denton, Coffee Planter.

5,600 feet.
Rain-fall and
Mean Temp.
not known.

V. NILGIRI HILLS.—*a. Coonoor.*—A full report of Captain Mann's plantation is recorded in Proceedings of Government, No. 1,272, dated 21st September 1859.

6,000 feet.
Rain-fall 55 In.

Besides this, there are a few plants at the undermentioned places.

*b. Ootacamund.*—Introduced or raised by Mr. McIvor, Government Gardens, from Saharunpore Seed and by General F. C. Cotton at Woodcote.

7,300 feet.

*c. Kaity.*—Introduced or raised by Sir S. Lushington and Lord Elphinstone.

Rain-fall 60 In.
M. Temp. 58°.

*d. Kulhutty.*—Introduced or raised by Mr. Rae.

VI. PULNI HILLS.—Major Hamilton reported that a considerable number of Tea plants at Kudaikarnal, were an inch or two above ground and appeared fresh and healthy.

7,100 feet.

VII. CURTALLAM.—I have received flowering specimens from the old spice garden, which correspond with the standard figures of *Thea Chinensis*. The shrubs are 20 years old, 12 to 15 feet high, and where the seed came from is not known.

1,200 feet.

VIII. TRAVANCORE.—Tea trees grow luxuriantly in Messrs. Binny and Co.'s plantations, (formerly Mr. Huxham's) 40 miles east of Quilon on the road to Curtallam, and from whence some plants were procured 10 or 12 years ago, which were planted at Vellymallay near Udagiri, 1,800 feet and at Athaboo near Tinnevelly frontier, 3,200 feet. At both places they are growing luxuriantly.

| | Altitude. | Rain-fall. |
|---|---|---|
| Caldoorty ........... | 6,700 feet | 150 to 200 Ins. |
| Vellymallay near Udagiri | 1,800 feet | 80 |
| Athaboo near Tinnevelly | 3,200 feet | 40 |

These facts are taken from General Cullen's letter to the Madras Government, and I may state that some seeds received from him were planted and throve on the Nílgiris at an elevation of 5,500 feet.

4. In Tea, as in all cultivated plants, there are variations, the discrimination of which is of the utmost importance commercially, and also in an economical point of view, but I have not materials for attempting a precise definition of these differences. This, however, is known that the seed having been obtained from different parts of China, the introduced plants varies in stature exceedingly, from a bushy shrub of 3½ feet to a ramous tree, 25 feet high.

5. There is a vast difference also between the narrow leaved forms and broad leaved specimens in some of the localities mentioned.

6. At present the leaves are taken indifferently from several sorts, which should not be done, when preparing Tea for commercial purposes ; and the means of manufacture, are of the rudest description.

7. The Tea shrub of commerce, though long confined to Eastern Asia, is now cultivated far beyond the limits of China, and Japan, in Java, (under the Equator) in Assam, the North West Provinces of Hindustan, on the banks of the Rio Janeiro, and recently in North America. From the published reports of Mr. Fortune and Dr. Jameson,* it appears to prefer a climate probably of 67° to 73° mean temperature. Such is nearly the mean temperature of the hill slopes near Kùnùr, Kotagiri, and of many of the valleys in the Eastern and Northern slopes of the Pulni and Nílgiri Hills, and also of the Bababooden range in Mysore, and of Kudra Muka in South Canara.

Java, (under Equator) Siam and China 10° to 31° N. L. (Fortune.)
Rio de Janeiro 22½° S. L. Tang-chow-foo 36° N. L. (Reeves.)
Principal districts between 27° and 31° N. L. (Fortune.)

* Selections from the Records of the Government of India, No. XXIII. 1857.

8. It ought also to be observed, as illustrative of the hardiness of the Tea shrub, that the cultivation extends over a great breadth of latitude (from the banks of the Rio Janeiro 22½° South Latitude, to the Province of Shan-ting in China 36½ North Latitude,) and that as we recede from the equator, the lowe latitude compensates for the difference of altitude. The Chinese cultivate on the lower slopes of the Hills, whilst in the North West Provinces, the culture is carried on between 2,000 and 6,000 feet.

9. This valuable plant has been found wild in Upper Assam and Cachar, whilst its congeners about on the Nílgiri and other mountain ranges of this Presidency. Its cultivation, therefore, might be attempted with good prospect of success in any of the localities mentioned in paragraph 7. In the case of Captain Mann's plantation near Kùnùr, we have the opinion of four competent judges† that the experiment had entirely succeeded as regards the growth of the plant.

† Mr. H. Ricketts, B. C. S.
" Stanishforth, B. C. S.
Major R. Strachey, Bengal Engineers.
Captain Impey, Bengal Engineers.

It now only remains to prove the merchantable character of the leaf, and this I hope will soon be tested.

10. So far as I can judge, the aid of a few practised manipu-

lators is all that is required to conduct the manufacturing processes. This I recommended in my‡ letter to Government, and I would beg again to solicit their attention to the proposal. Enclosed is a letter on this subject received by me from Dr. Jameson, at the time the question was broached, also extracts from Sir Emerson Tennant's erudite work on Ceylon, corroborative of the views expressed on this important point.

‡ Dated 27th August 1859, No. 762, recorded in Proceedings of Government, No. 1,272, dated 21st September 1859.

11. Much useful information will be obtained from Fortune's works, especially his "Visit to the Tea Districts of China," and "A short guide to Planters cultivating Teas in the Himalayas and Kohistan of the Punjab," by Dr. Jameson.§ Intending Tea Planters ought also to study carefully Mr. Ball's excellent work on the "Cultivation and maufacture of Tea," and the "Theory of Horticulture" by Professor Lindley, a knowledge of the principles of culture being indispensable to success.

§ Selection from the Records of the Government of India, No. XXIII, 1857.

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From W. Jameson, Esq., Superintendent Botanical Gardens, North West Provinces, to H. Cleghorn, Esq., m. d., Conservator of Forests, Madras, dated Kowlangiri, Deyra Dhoon, 5th September 1859, No. 431.

I have the honor to acknowledge the receipt of your letter, No. 741, dated 6th ultimo, regarding Tea makers. I am glad to hear that Tea cultivation is making steady progress in the Madras Presidency. I have no Chinese Tea makers available to send to the Nilgiris, but I can provide you with four excellent Native Tea manipulators, who have been for years working in the factories and are nearly as expert at their work as the Chinese. To several private factories, I have supplied Natives brought up as Tea makers in the Government factories, and by them excellent Teas have been prepared. Thus all the Teas prepared at Hurbawallah in the Deyra Dhoon estimated at lbs. 10,000 this season

have been prepared by Natives furnished by me, and these Teas are much prized by the public, and fetch high prices.

Four (4) Native Tea makers are willing to proceed to the Nílgiris, and serve for three years on the following conditions.—

(1.) Their wages to be Rupees 12 *per mensem* each, for the first year, and Rupees 16 each *per mensem* for the second and third years.

(2.) All their expenses to be paid to and from the Nílgiris.

(3.) Their wages to be paid them from the date of leaving the plantation at Kowlangiri in the Deyra Dhoon.

(4.) Their agreement to continue in force for three (3) years from the date of their arrival at the plantation in the Nílgiris.

(5.) On discharge, their expenses to be paid and a free passage given to them to Kowlangiri in the Deyra Dhoon. Their wages to cease from the date of their discharge from the plantation on the Nílgiris.

With these men I am confident that you will be able to do all that you require towards ascertaining the quality of the leaf yielded by the Tea plants growing on the Nílgiris. With the men I will send a series of baskets, &c. required in manipulating Teas, and Dr. Thomson of the Calcutta Botanical Gardens can procure for you from Messrs. Thomson and Co., Hardware Merchants, such pans as you require. If I can assist you in any other way, it will give me much pleasure.

P. S.—These four (4) men agree to work diligently in the plantations and make themselves generally (useful) when their services are not otherwise required in the Factory. But in order that there may not be any dispute I shall, if agreeable to you, write their agreement on Stamped paper.

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### *Extracts from Tennant's Ceylon.*

" The Tea plant has been raised with entire success on the " Estate of Messrs. Worms, at Rothchild in Pusilawa; but the " want of any skilful manipulators to collect and prepare the dry " leaves, renders it hopeless to attempt any experiment on a large

" scale until assistance can be procured from China, to conduct " the preparation." Volume I, page 90.

" The plants thrive surprisingly, and when I saw them they " were covered with bloom. But the experiment was defeated by " the impossibility of finding skilled labor to dry and manipulate " the leaves. Should it ever be thought expedient to cultivate " Tea in addition to Coffee in Ceylon, the adaptation of the soil " and climate has thus been established, and it only remains to " introduce artisans from China to conduct the subsequent pro- " cesses." Volumes II, page 252.

(Signed) H. CLEGHORN,

*Conservator of Forests.*

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ORDER THEREON, 24th August 1860, No. 1,425.

1, The Governor in Council has perused this report with much interest. It contains much useful information on the subject treated of. It will be communicated to the Board of Revenue, to the Collector of Coimbatore, to the Commissioner of Mysore, and to the Literary Society for publication in their journal. A copy will also be laid on the Editor's table and a number of spare copies will be printed for sale or distribution.

2. The report will also be sent to the Secretary of State.

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# PROCEEDINGS.

*At a Meeting of the Managing Committee of the* Madras Literary Society *and Auxiliary of the Royal Asiatic Society held at the Club house on Thursday the* 12*th April* 1860, *at half past* 6 *o'Clock P. M.*

PRESENT.

The Honorable Mr. Maltby.
G. F. Fullerton, Esq.
H. B. Montgomery, Esq., M. D.
J. T. Wheeler, Esq.
W. Hudleston, Esq., *Secretary.*

The Secretary laid before the Meeting the usual Monthly Statement of the Society's Funds prepared up to 12th Instant.

Here enter Statement.

Resolved that the above Statement is satisfactory and be passed.

Read letter from Mr. D'Rozario the Assistant Librarian requesting an increase of Salary.

Resolved that the Committee cannot comply with this application.

Resolved that the Pay of the Bill Collector be fixed at Rupees Eight per mensem.

Read Proceedings of Madras Government dated 2nd March 1860, No. 455, containing Accounts of Earthquakes at Tripati and Chendragiri.

Ordered to be transferred to the Sub Committee of Papers.

Read Proceedings of the Madras Government with reference to the Secretary's letter recommending that a set of the Crania prepared by the Messrs. von Schlagentweit should be applied for.

Resolved that a Copy of the above Proceedings of Government be forwarded to Messrs. von Schlagentweit with a request that they will be good enough to furnish the Society with the information required by the Government.

Read letter from Messrs. de Schlagentweit acknowledging receipt of £133-4 and announcing the despatch of another set of Ethnographical Casts.

Ordered to be recorded.

Read letter from Mr. T. Harris forwarding a specimen of Poetry.

Resolved that the Secretary inform Mr. Harris that Poetry is not suited to the purposes of the Journal.

Read letter from E. B. Powell, Esq. and a Communication from Dr. Caldwell to Sir C. Trevelyan relative to Manuscripts left by Lieutenant Frye.

Resolved that Copy of Mr. Powell's letter and Extract from the Communication of Dr. Caldwell be submitted to Government with a request from the Society that application be made to the Home Government for the Manuscripts alluded to.

Read Communication from W. H. Bayley, Esq. relative to romanising the Oriental characters.

Resolved that Mr. Bayley's communication be printed in the next number of the Journal in continuation of the Report published, and that a printed Copy thereof be forwarded to Government.

Resolved that several Papers relating to Water glass, and three articles thereon published in the London Athenæum be republished in the Journal.

Dr. Montgomery submits Copy of No. 9 of the Journal, and expresses his regret at his inability to continue the Editorship of the Society's Journal in consequence of the numerous professional demands on his time.

Mr. Wheeler consents to assume temporary charge of the duty, and to ascertain whether Colonel Adye is willing to undertake it for the future.

Resolved that the best thanks of the Society are due to Dr. Montgomery for the trouble he has so long taken in the matter.

Read letters from the Secretary to the Royal University of Christiania forwarding several Publications in Norse.

Ordered to be acknowledged with thanks.

E. MALTBY,
*President.*

W. HUDLESTON,
*Hon. Secretary.*

*At a Meeting of the Managing Committee of the* Madras Literary Society *and Auxiliary of the Royal Asiatic Society held at the Club house on Thursday the* 10*th May* 1860, *at half past* 6 *o' Clock P. M.*

PRESENT.

| | |
|---|---|
| The Hon. Mr. Maltby, *Chairman.* | G. F. Fullerton, Esq. |
| A. Hall, Esq. | H. B. Montgomery, Esq., M. D. |
| J. T. Wheeler, Esq. | W. Hudleston, Esq., *Secretary.* |

The Secretary laid before the Meeting the usual Monthly Statement of the Society's Funds prepared up to 10th Instant.

(Here enter Statement.)

Resolved that the above Statement is satisfactory and be passed.

Read Proceedings of Government forwarding Messrs. de Schlagentweit's letter acknowledging the receipt of £133-4, and announcing the dispatch of another set of Ethnographical Casts

Ordered to be recorded.

Read two Proceedings of Government forwarding several District Engineers' Reports on the subject of ancient Architectural Remains.

Ordered to be transferred to the Sub Committee on Papers for publication in the Journal.

Read amended Bill from the Legislative Council of India relative to the Registration of Literary, Scientific and Charitable Societies.

Ordered to be recorded.

Read letter from Messrs. Allen and Co. in reply to the Secretary's letter of the 17th February last, relative to the earlier supply of books of note.

Ordered to be recorded.

*At a Meeting of the Managing Committee of the* MADRAS LITERARY SOCIETY *and Auxiliary of the Royal Asiatic Society held at the Club house on Thursday the* 14*th of June* 1860, *at half past* 6 *o' Clock P. M.*

PRESENT.

| | |
|---|---|
| The Hon. Mr. Maltby, *Chairman.* | J. T. Wheeler, Esq. |
| Major W. J. Wilson. | W. Hudleston, Esq., *Secretary.* |

The Secretary laid before the Meeting the usual Monthly Statement of the Society's Funds prepared up to the 14th Instant.

(Here enter Statement)

Resolved that the above Statement is satisfactory and be passed.

Read letter from H. King, Esq., offering to prepare a translation of Jurieu's Alary System of Classification in the " Suites á Buffon"--Hymenoptera.

Resolved that Dr. King's offer be accepted with the thanks of the Committee.

Read letter from H. Nelson, Esq. complaining of books not being fairly circulated, and that interesting works find their way into private circulation.

Resolved that the following Circular be issued to Members of the First Class.

CIRCULAR.

Complaints have reached the Committee from Members regarding the delay that takes place in the circulations of new books, and as it is beyond a doubt that Book of unusual interest do not seldom, soon after receipt, find their way into the hands of Non-subscribers to the first Class, and of persons not Members of the Society, to the manifest loss of those who pay a large subscription to obtain a benefit of which they are thus unfairly deprived, the Committee call on all Members of the Society to aid them in putting a stop to a practice which is most injurious to the Society and most unfair to individuals.

(Signed) W. HUDLESTON,
*Secretary.*

Read Proceedings of Government in the Revenue Department forwarding Lieutenant Beddome's Report of an Excursion to the higher ranges of the Anamalai Hills.

Resolved that application be made to the Chief Secretary to Government for Lieutenant Beddome's former "Notes on the higher ranges of the Anamalai Hills."

Resolved that the Subscription for "Bentley's Miscellany" and the "New Monthly Magazine" be discontinued, and that the other Periodicals be supplied as per following scale.

| | | | |
|---|---|---|---|
| Quarterly. | Westminster Review | 2 | Copies. |
| | Edinburgh do | 4 | do |
| | Quarterly do | 4 | do |
| | North British do | 1 | do |
| | N. American do | 1 | do |
| | Calcutta do | 1 | do |
| Monthly. | Art Journal | 1 | do |
| | Blackwood's Magazine | 3 | do |
| | Fraser's do | 3 | do |
| | United Service do | 2 | do |
| | Dublin University do | 2 | do |
| | Universal Review | 1 | do |
| | Atlantic Monthly | 1 | do |
| | Cornhill Magazine | 2 | do |
| | Macmillan's do | 2 | do |
| Serial | One of them | 1 | do |
| Bi-monthly. | Revue des deux Mondes | 1 | do |
| Weekly. | Saturday Review | 3 | do |
| | London Athenæum | 2 | do |
| | All the year round | 2 | do |
| | Once a Week | 2 | do |

E. MALTBY, W. HUDLESTON,

*Chairman.* *Secretary.*

*At a Meeting of the Managing Committee of the* MADRAS LITERARY SOCIETY *and Auxiliary of the Royal Asiatic Society held at the Club House on Thursday the* 12*th July* 1860, *at half past* 6 *o'Clock P. M.*

PRESENT.

| | |
|---|---|
| The Hon. E. Maltby, *Chairman.* | J. T. Wheeler, Esq. |
| A. Hall, Esq. | W. Hudleston, Esq., *Secretary.* |
| J. D. Mayne, Esq. | |

The Secretary laid before the Meeting the usual Monthly Statement of the Society's Funds prepared up to 12th July 1860,

(Here enter Statement)

Resolved that the above Statement is satisfactory and be passed.

Read Communication from the Rev. W. Taylor relative to the fixity of the Poles.

Ordered to be transferred to the Sub Committee on Papers.

The Rev. Mr. Taylor presents to the Society's Library the following books.

" Catalogue Raisonnee of Oriental Manuscripts in the Library of the (late) College."

" Memoir of the First Centenary of the Earliest Protestant Mission at Madras."

Four Lectures on Elocution, delivered at the Polytechnic Institution in November 1847."

Resolved that Mr. Taylor's donation be acknowledged with the thanks of the Committee.

Resolved that the Secretary be authorised to offer to the Committee of the Ootacamund Public Library one Set of all Periodicals of which spare Numbers are available.

*At a Meeting of the Managing Committee of the* MADRAS LITERARY SOCIETY *and Auxiliary of the Royal Asiatic Society held at the Club House on Thursday the 9th August* 1860, *at half past* 6 *o'Clock P. M.*

PRESENT.

| | |
|---|---|
| The Hon. E. Maltby, *Chairman.* | J. T. Wheeler Esq. |
| H. F. Cleghorn, Esq, M. D. | W. Hudleston Esq, *Secretary.* |

The Secretary laid before the Meeting the usual Monthly Statement of the Society's Funds prepared up to 9th August 1860.

(Here enter Statement.)

Resolved that the above Statement is satisfactory and be passed.

The Secretary is instructed to remit £100 to Messrs. Allen and Co. on account at the most favorable rate of Exchange obtainable.

Read communication from Major H. Congreve on Druidical Remains in South India.

Ordered to be transferred to the Sub Committee on Papers.

Read Proceedings of Government on a letter from F. N. Maltby, Esq. President at Travancore and Cochin relative to the Progress of Public Works in those States.

Ordered to be transferred to the Sub Committee on Papers.

The Secretary laid before the Meeting 2 Pamphlets received from Dr. Scherzer of the Austrian Frigate Novara showing the track of the voyage.

Ordered to be acknowledged with thanks.

The Secretary laid before the Meeting Remarks on Major Cunningham's account of Topes at Bhilsa and Sanchi, by the Rev. W. Taylor communicated by the author.

Ordered to be transferred to the Sub Committee on Papers.

Read letter from Dr. Cleghorn forwarding a spare Copy of the Notes of an Excursion to the higher ranges of the Anamalli Hills.

Ordered to be transferred to the Sub Committee on Papers.

Dr. Cleghorn communicates to the Society the first of a series of contributions by Lieutenant Beddome on the Botany of Southern India offered for publication in the Society's Journal.

Ordered to be transferred to the Sub Committee on Papers.

*At a Meeting of the Managing Committee of the* MADRAS LITERARY SOCIETY *and Auxiliary of the Royal Asiatic Society held at the Club House on Thursday the* 13*th September* 1860, *at half past* 6 *o'Clock P. M.*

PRESENT

| | |
|---|---|
| The Hon. E. Maltby, *Chairman.* | A. Hall, Esq. |
| H. F. Cleghorn, Esq. M. D. | J. T. Wheeler, Esq. |
| H. B. Montgomery, Esq. M. D. | W. Hudleston, Esq. *Secretary* |

The Secretary laid before the Meeting the usual Monthly Statement of the Society's Funds prepared up to the 13th September 1860.

Here enter Statement.

Resolved that the above Statement is satisfactory and be passed.

Read extract from Proceedings of Government in the Revenue Department containing letter from Dr. Cleghorn on the Tea plantations in different parts of the Presidency.

Ordered to be transferred to the Sub Committee on papers.

Read letter from M. Robert de Schlagintweit forwarding Prospectus of a work on India and High Asia.

Resolved that one copy of the work in question be subscribed for the Society.

Read letter from Monsieur Haidinger acknowledging receipt of certain numbers of the Society's Journal.

Ordered to be recorded.

Read letter from the Secretary to the Royal Society of Antiquarians of the North acknowledging a number of the Society's Journal; and forwarding " The Northmen in Iceland, &c. and some packets to be forwarded to their respective addresses.

To be acknowledged with thanks and the packets distributed.

Read letter from the Secretary to the Royal Society Edinburgh acknowledging receipt of No. 6 of the Journal.

Ordered to be recorded.

The Secretary lays before the Meeting copy of Meteorological Observations at Bangalore for 1859, received from J. Puckle, Esq., Mysore Commission.

Ordered to be transferred to the Sub Committee on papers, and to be acknowledged with thanks.

Dr. Cleghorn communicates to the Meeting a Memoir of Dr. Rottler by the Rev. T. Foulkes and a copy of Mr. Clement Markham's Narrative of his journey to Peru and Bolivia to procure plants and seeds of the Cinchona for introduction into India and Ceylon.

Ordered to be transferred to the Sub Committee on papers for publication in the next number of the Journal.

The Secretary lays before the Committee a letter from Dr. Montgomery begging to resign the editorship of the Journal.

The Committee regret that they can no longer have the benefit of Dr. Montgomery's good services, and beg to thank him for the assistance he has hitherto afforded them in the Journal department.

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*At a Meeting of the Managing Committee of the* Madras Literary Society *and Auxiliary of the Royal Asiatic Society, held at the Club House, on Thursday, the* 11*th October*, 1860.

PRESENT.

Colonel J. M. Adye, c. b.
J. T. Wheeler, Esq.
W. Hudleston, Esq., *Secretary.*

The Secretary laid before the Meeting the usual Monthly Statement prepared up to 11th Instant.

Resolved that the above Statement is satisfactory and be passed.

Read letter from Messrs. Schlagintweit, intimating the price of the Crania, in reply to a communication to them on that subject.

Resolved that Messrs. Schlagintweit's letter be submitted to Government with reference to Proceedings of Government, Public Department, and order thereon dated 15th March 1860, No. 376.

Read Proceedings of the Madras Government, and order thereon dated 21st September 1860, No. 564, relative to Experiments with Coals from the Nerbudda Valley.

Ordered to be transferred to the Sub-Committee on Papers.

Ordered that the Selections from the Records of Travancore, Nos. 1 and 2 and Annual Report of the Geological Survey of India presented by the Madras Government be included in the Book List.

Resolved that the following Books be ordered from England.

1. Gathering of a Naturalist in Australasia being Observations principally in the Animal and Vegetable Productions of New South Wales, New Zealand and some of the Austral Islands. By George Bennett, 8vo. pp. 460, cloth 21*s* (Van Voorst )

2. Egypts Place in Universal History: by Baron Bunsen. Translated from the German, by C. H. Cotterill, Esq., Vol. 4th 8vo. pp, 698, cloth 25*s* (Longman.)

3. Sporting Scenes among the Kaffers of South Africa. By Alfred W. Drayson, 2nd Edition, post 8vo. pp. 330, half bound, 5*s*. (Chapman and H.)

4. From Hay time to Hopping. By the Author of "Our Farm of Four Acres" 12mo. pp. 240, cloth 5. (Chapman and H.

5. Bardes Bretons (Les,) forms du Vie siecle, tradints pour lá premiere fois en français avec le texte en regard par le vicomte Hersart de la Villemarque. Nouvelle edition, 8vo. (Paris.)

6. Bavoux (E. et A. F.) Voltair á Ferney sa correspondance avee la duchesse de Saxe Gotha, suivie de letters et de notes historiques entirement inedites, 8vo. (Paris) 6*s*.

7. Beranger, Ouvres posthumes. Edition illustrée 2 Vols. 8vo. avec 24, gravures sur acier (Paris) each 10*s*.

8. Correspondence de Napoléan la, publ ée par order de l'empereur Napolean III. (from the commencement.)

9. Faber (J) La Religion de Muscovite en 1525. Une ambassade russe a la cour de Louis 14th, 24mo. (Paris) 2*s* 6*d*.

10. Memoirs historiques, politiques, et militairs sur la Russie, depuis l'anne 1727 jusquá 1744 par le général de Manstein. Nouvelle èdition collationnee sur le manuscript original, corrigé par le mani de Voltair, 2 vols. 18mo. (Paris) 6*s*. 6*d*.

11. Memoirs de duc de Luynes sur la cour de Louis 15th (1735-1738) publies sous le patronage de M. le duc Luynes par M. M. L. Dussieux et E. Soulie, vols. 1 and 2; 8vo. (Paris) each 5*s*.

12. The Wintermg of the Hollanders in Nova Zembla, during the years 1596 and 1597. By C. H. Tollens. Translated from the Dutch by Anglo Saxon, Post 8vo. 2*s*.

13. Artist and Craftsman: a Novel 8vo. 10*s*. 6*d*.

14. Lights and Shadows of Church Life in Australia. By T. Binney 2d edition post 8vo. pp. 200, cloth 5*s*. (Jackson and W.)

15. The Semi-attached couple. By the Author of the "Semi-detached House" 2 vols. post 8vo. pp. 520, cloth, 21*s*. (Bentley).

16. A Journey in the Back Country. By Frederick Law Olmsted. Crown 8vo. (New York) 1860, pp. 492, cloth London 8*s*. 6*d*.

17. Over the Cliffs. By Mrs. Chanter, Author of Ferny Combs, 2 vols. (Smith, Elder, and Co.)

18. On the Conduct of Life, by Ralph Waldo Emerson, Author of "Representative Men," "Essays" &c. Smith, Elder and Co.)

19. Jominis Strategy; extracted from the precis de l'art de la guerre, by Ensign Adam, 22d B. N. I. (Saunders, Otley and Co.)

20. Dr. Thomson's New Zealand.

W. HUDLESTON,
*Secretary.*

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*At an Annual General Meeting of the Members of the* MADRAS LITERARY SOCIETY *and Auxiliary of the Royal Asiatic Society held at the Club House, on Thursday the* 28*th February* 1861, *at* 6 *o' Clock P. M.*

PRESENT.

The Honorable E. Maltby.
The Hon. W. A. Morehead.
R. S. Ellis, Esq, C. B.
A. Sullivan, Esq.
A. Hall, Esq.
J. T. Wheeler, Esq.
Colonel T. McGoun.
Captain H. Roberts.
Captain T. Evans Bell—*Secy.*

Mr. Maltby is requested to take the Chair.

The Secretary laid before the Meeting the Report and Statement of the Society's Funds up to the end of the past year.

The Report is approved and the Accounts passed.

The Meeting proceeds to the election of the Managing Committee for the current year.

Proposed and carried unanimously that the Members of the

present Committee be re-elected, and that R. P. Harrison, Esq., R. S. Ellis, Esq., C. B., and Captain H. Roberts be requested to become Members of the Committee.

Proposed by A. Sullivan, Esq., and seconded by J. T. Wheeler, Esq., that the thanks of the Society be presented to W. Hudleston, Esq., for his able Services as Secretary.

Carried unanimously.

Proposed and carried unanimously that R. S. Ellis, Esq., and J. T. Wheeler, Esq., with the Secretary, form a Sub Committee of papers, and that they be requested to arrange for the continuous publication of the Journal.

Proposed that the Members of the 1st and 2d Classes be invited to join the dinners of the Literary Society on the Second Thursday of each month, formerly confined to the Committee, and that the Secretary be requested to give sufficient Notice to the Members.

Carried unanimously.

T. EVANS BELL,
*Secretary.*

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*At a Meeting of the Managing Committee of the* MADRAS LITERARY SOCIETY *and Auxiliary of the Royal Asiatic Society held at the Club House on Thursday the* 14*th March* 1861, *at half past* 6 *o'Clock P. M.*

PRESENT.

The Honorable Mr. E. Maltby, *Chairman.*
R. P. Harrison, Esq.
Captain H. Roberts.
J. T. Wheeler, Esq.
R. S. Ellis, Esq., C. B.
J. D. Mayne, Esq.
Capt. T. Evans Bell, *Secretary.*

The Secretary laid before the Meeting the usual Monthly Statement of the Society's Funds prepared up to 14th instant.

(Here enter Statement.)

Resolved that the above Statement is satisfactory and be passed.

Read letter from the Messrs. de Schlagintweit announcing the despatch, on the 14th September 1860, of Ethnographical cuts of heads, hands and feet, and enclosing a bill for the same.

To lie over until the boxes arrive, when Government will be addressed on the subject.

Read Letter from T. Oldham, Esq. to T. Pycroft, Esq. on the subject of supposed Rock Salt found near Kircumbaddy.

Referred to the Sub Committee for Papers.

Read Letter from the Private Secretary to His Excellency the Governor stating that Sir W. Denison will have much pleasure in becoming Patron of the Society.

To be recorded.

Read letter from Colonel T. M. Adye, C. B., requesting that, in consequence of his departure from Madras, his name may be removed from the List of Subscribers.

Resolved that General McCleverty be requested to join the Managing Committee in the place of Colonel Adye.

Read letter from Captain Raverty forwarding Pushto Grammar; Dictionary and Text-book—Poetry and Prose.

To be recorded.

Read letter from Major H. Congreve inquiring whether his two Papers on Druidical Remains and on the Buddhist Stones at Masulipatam have been accepted for the Journal, and forwarding a Paper on the altered Rocks of the Neilgherries.

Major Congreve is to be informed that his two Contributions have been selected for publication in the Journal, and are now in the Printer's hands; and the Paper to be referred to the Sub Committee on Papers.

Read letter from H. G. Smith, Esq. to T. Pycroft, Esq. reporting a rather severe shock of Earthquake at Salem.

Referred to the Sub Committee on Papers.

The Secretary pointed out to the Meeting the necessity of procuring two additional Book shelves at a cost of Rupees Sixty.

E. MALTBY, *Chairman.*

T. EVANS BELL, *Secretary.*

## Agricultural and Horticultural Society of Madras.

*Proceedings of a Special Meeting of the Committee, held at the Gardens on Friday evening,* 19*th October* 1860.

PRESENT.

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|---|---|
| Colonel McCally, *President.* | H. B. Montgomery, Esq., M. D. |
| Colonel Colbeck. | Revd. J. R. Macfarlane, Esq., |
| Amir Ud Dowlah Bahadoor. | *Hony. Secretary.* |

With reference to the intention expressed in the Annual Report, the Committee proceed to consider the propriety of defraying the expenses of providing a Band once a week.

The expenses of this may be estimated at Rs. 32 per mensem, if the Band attends once a week.

The Committee regret that they are not at present in a position to defray this expense, but request that the Secretary will kindly endeavour to prepare some scheme whereby it can be met by Members of Society generally.

The Committee resolve to postpone the consideration of the subject of the expenses of the Annual Exhibition until next Meeting.

It is ordered that the accounts of the Society and the Report of the Auditors shall be circulated to the Committee when they are reeeived.

Read Correspondence relative to the naming of individual plants sent out to Members gratuitously.

Resolved that the Superintendent be instructed to name any special plants sent out to Members, if a request to this effect be forwarded in writing with the application for plants.

Members however are solicited to bear in mind when forwarding applications for plants "to be named" that, the duties of the Superintendent do not allow of his naming large numbers of them, and that he is only to be expected to label those of an important character, or unusual rarity.

The Committee regret that a recent misunderstanding of this point should have occurred, but trust that the foregoing rule will prevent any inconvenience hereafter.

The following gentlemen are unanimously elected Members of the Society.

J. W. B. Dykes, Esq., c. s.; Colonel Birdwood and M. V. Thavakylasan Moodelliar.

Read the following letter from Dr. Montgomery, who had previously left the Meeting.

To Colonel McCally,

*I resident of Committee.*

Sir,

I regret to inform you that I am compelled by ill-health and by my intended return to Europe to resign the Office of Secretary to the Society, and have only to add the expression of my hope, that the Committee will kindly make arrangements to have me relieved with as little delay as suits their convenience.

I have the honor to be, &c.

Signed Howard B. Montgomery, m. d.
*Hony. Secy. A. H. S.*

Resolved that Rev. J. R. Macfarlane be requested to accept the office of Secretary to the Society.

Mr. Macfarlane expressed his willingness to meet the wishes of the Committee and to accept the office until the return of Dr. Montgomery.

The Committee cannot accept Dr. Montgomery's resignation without placing on record the deep sense they entertain of the very great ability, zeal, and courtesy which have characterized his management of the gardens and which have so materially advanced their prosperity and increased their popularity. They beg to tender him their best thanks, and to express their cordial good wishes, that in due time he may return with renovated health to resume the duties which he has hitherto discharged with such general satisfaction.

Resolved that a copy of this Resolution be forwarded to Government.

Signed A. McCally, *President.*

J. R. Macfarlane, *Hon. Secy.*

## AGRI-HORTICULTURAL SOCIETY MADRAS.

*Proceedings of a Meeting of the Committee held at the Gardens on Wednesday morning the* 14*th November* 1860.

PRESENT.

Amir Ud Dowlah Bahadoor, in the Chair.

Clement Dale, Esq.
Robert Hunter, Esq.
G. J. Shaw, Esq.
Revd. J. Ruthven Macfarlane, *Honorary Secretary.*

Read letters from Major Fitzmaurice, 39th Regiment, Trichinopoly.

Resolved, that the mistake be explained to Major Fitzmaurice, with an expression of the Committee's regret, and that the amount charged beyond the limit which he originally named be now returned.

The Secretary submitted the accounts of the Annual Flower and Fruit show for 1860 amounting to Rs. 782-12-6. The Committee observe that the expences of this show are greatly in excess of those of former years and more particularly that the number and amount of the prizes are greatly on the increase. They consider that the expenditure in this as well as other departments of the show should be reduced as far as consistent with efficiency and brought if possible within the special revenue raised for this purpose. They appoint a Sub Committee consisting of Col. McCally, the President, Dr. Shaw and the Honorary Secretary, to consider and report on the arrangements.

The Secretary reported that the Superintendent had visited Bangalore to examine the Public Gardens and to obtain a supply of new or rare plants and to make arrangements for obtaining them at all times for the Gardens, and also for subscribers who may require and be willing to defray the actual expense incurred.

The Superintendent is requested to circulate his Report to the Committee at an early date.

The Secretary intimated the receipt from Government of the following works, viz.

1. Annual Report of the Geological Survey of India and the Museum of Geology, 1860.

Selections from the Records of Government.

2. No. 1.—Memoir of Travancore.

3. No. 2.—Report of the countries of Travancore and Cochin.

4. "The Green Dye of China and green dying of the Chinese."

5. Flora Andhrica, a vernacular and botanical list of plants commonly met with in the Telugu districts of the Northern Circars. By Walter Elliot, Esq. F. L. S., &c.

Resolved that the thanks of the Committee be conveyed to Government for these valuable contributions.

It having been brought to the knowledge of the Committee that Subscribers have been occasionally disappointed in obtaining plants; the Committee, while aware that this may be explained in part by the past season having been very unfavorable especially to the cultivation of roses and by the nursery having been recently transferred to the new portion of the Gardens, resolve to direct the attention of the Superintendent to the necessity of increasing the stock of young plants so as to meet all the reasonable demands of the Subscribers and the public. They desire however to remind Members that when new varieties of roses and other plants are received, a very considerable period must necessarily elapse before they can be propagated to such an extent as to afford even a very llmited supply to all the Subscribers.

AMIR UD DOWLAH BAHADOOR,

J. RUTHVEN MACFARLANE,

*Hony. Secretary.*

## Agri-Horticultural Society.

*Proceedings of a Meeting of the Committee held at the Gardens on Monday the 24th December* 1860.

PRESENT.

Col. McCally.—*President.*

Col. Simpson.
G. J. Shaw, Esq., M. D.
Amir Ud Dowlah, Bahadoor.
Revd. J. Ruthven Macfarlane, *Honorary Secretary.*

Read letter from Captain Roberts.

The Committee regret that any mis-apprehension should have arisen regarding the Band Fund, and that in the absence of the late Secretary, they are unable to offer any further explanation beyond what has already appeared in the Records. They cordially acknowledge Captain Roberts' obliging exertions in the matter, and as there appears to be some doubt as to the days in which the Band should play in the Gardens, they request the Secretary to communicate with the Honorable the Governor on the subject and thereafter to intimate to Captain Roberts what carriage will be necessary.

The following Gentlemen were proposed and unanimously elected Members of the Society.

Major General McCleverty, Henry F. Chamier, Esq., Captain B. Roberts and Charles Grace, Esq.

With reference to the Proceedings of last Meeting regarding the feeling of dissatisfaction entertained by some of the members as to the irregular supply of flowers and plants to Subscribers, the Committee direct that an Order book shall be kept by the Superintendent, in which all orders shall be entered and that such orders shall be executed strictly in order of priority ; and farther, that for the convenience of Members, the Order book shall lie on the table in the Garden house, that they may, if preferred, enter their orders in person, care being taken to date and sign all such orders and applications as they are made.

It was resolved to publish the list of flower and vegetable seeds

distributed last year and to solicit any remarks or reports from the Subscribers as to their adaptation to this climate ; and as it is possible that there are other seeds which might be more successfully cultivated and therefore substituted for some of those on the present list, the Committee will be glad to receive suggestions on the subject,

### LIST OF VEGETABLE SEEDS.

Knol kohl,
Cabbage Emperor,
,, Wheeler's Imperial,
,, Sugar loaf,
Brussels sprouts (imported,)
Savoy, Globe,
Celery coles red,
,, Crystal white,
Endive mixed,
Turnip—selected, stone.
,, Maltese Yellow.
Beet, small selected,
Lettuce, Drumhead,
,, Paris white,
Vegetable marrow,
Radish, mixed Turnip,
Carrot, Long Surrey,
Tomato, mixed,
Parsley, curled,
Cucumber, Long Prickly,
Gourd hundred weight,
Teek, Flag,
Cauliflower, early.

### LIST OF FLOWER SEEDS.

Mignionette,
Balsam double mixed,
Phlox Drummon du var,
Carnation mixed,
Calliopsis ,,
Ipomopsis,
Silene barbala,
Petunia mixed,
Sweet Peas,
Scarlet Geranium,
African marigold,
French do.
Mesembryan themum mixed,
Nasturtions,
Naurandya,
Portulacca,
Holy hock,
Lophospermum finest,
Browallia ,,
Brachycome ,,
Larkspur,
Indian pink mixed,
Nolana ,,
Lobelia,
Martynia fragrans,
Zinnia elegans mixed,
Tropaolum perigrinum,
Gai lordia,
Heartsease,
Peatstemon mixed,
Saliva. ,,
Hebchrysum ,,

Read letter from Dr. Mudge, Honorary Secretary to the Peoples' Park Committee. The Committee regret that keeping in view the interests of the Gardens, it is not in their power to comply with the request of the Committee of the Peoples' Park to supply the Park with trees and shrubs free of cost. The number of these already supplied amounts to about one-fourth of the whole reared in and sent out from the Gardens, entailing for the last 18 months the additional expense of two Gardeners. The Gardens are supported mainly by *private* subscriptions ; it cannot therefore be expected that the Committee of the Peoples' Park should have an unlimited supply gratis, when the subscribers themselves are restricted in their indents. As the Committee however are most desirous to render every possible assistance to such a laudable public undertaking, they instruct the Honorary Secretary to address the following letter to the Secretary of the Park.

*  *  *  *

Read the following Report by the Superintendent regarding his visit to the Bangalore Gardens.

As requested in my letter of the 20th of October, I obtained 10 days leave to make a visit to the Government Gardens, Bangalore, and procure plants for this Garden.

Annexed is a list of the plants I brought down. The number of novelties is not so great as I expected, for although the Garden has been a long time established, very little has been done in introducing new plants, and we are at present in a better position to help them with plants than they are to help us, except with Aloysias, Heliotropes, Fuchsias and plants of that description, and also Roses.

I made arrangements with Mr. New, the Superintendent, to establish a regular system of Exchange between the two Gardens, as plants from Ootacamund and other High Lands grown in Bangalore for a year or two, will stand the heat of the Plains much better after being partly acclimatized in the Bangalore Garden.

I brought the plants down *via* Tripatore. They were only six days on the road, and I had very few casualties. The expense

was about the same as if the bandies had come the whole way, but this can be reduced by sending the plants by a good train.

The amount of my travelling expenses is Rupees sixty-eight and annas nine (68-9-0) and the cost of bringing down the Plants Rupees 25.

R. BROWN,
*December*, 1860. *Superintendent.*

Read letter from Major DeSausmarez, Commanding Hong-Kong.

The Committee gladly avail themselves of Major DeSausmarez kind offer to procure and forward a selection of plants and flowers. Besides Orchides and Camelias, there are several flowers and shrubs, which it is believed might be successfully introduced here.

A List will be forwarded with directions for packing them in Ward's Cases, the expense attending which, the Committee will gladly defray. The Secretary is requested to communicate with the Quarter Master General as to their being brought over.

The Committee sanction the erection of an Aviary in the Gardens. A plan and estimate to be submitted, and the selection of the site and other arrangements to be left to the Superintendent under the direction of the Secretary.

The Committee sanction the making up of a few additional benches of a pretty, rustic pattern for the accommodation of the visitors.

The Committee thankfully acknowledge the receipt from Government of—

1. Selections from the Records of Travancore.
2. Journal of the Agri-Horticultural Society of India.
3. Selections from Records of the Government of India, viz. Report of the Teak Forests of Pegu.

A. MCCALLY, Colonel,
*President.*

J. RUTHVEN MACFARLANE,
*Honorary Secretary.*

*Proceedings of a Meeting of the Committee held at the Gardens on Wednesday 14th January* 1861.

PRESENT.

Colonel McCally.—*President.*

Colonel Colbeck.
C. Dale, Esq.
Colonel Simpson.
G. J. Shaw, Esq., M. D.
Andrew Scott, Esq., M. D.
Revd. J. Ruthven Macfarlane, *Honorary Secretary.*

MEMBERS.

Brigadier Whistler.
Colonel Marshall, Mily. Secy. to Govt.
R. P. Harrison, Esq., Acct. Genl.
William Scott, Esq., and
Dr. Flynn.

It was resolved to obtain by way of experiment, a portion of the Flower Seeds for the ensuing season from France and also from Messrs. Veitch and Co. whose reputation stands high as export Seedsmen.

The Secretary reported that he had obtained the authority of the Quarter Master General for the collection of Plants and Flowers from Hong Kong being forwarded to Madras free of charge in any of H. M.'s Transports.

The Secretary reported that he had communicated with the Honorable the Governor regarding the services of the Band, and that His Excellency was pleased to direct that, until further orders, it should play at the Gardens every *alternate* Tuesday.

The Sub Committee appointed to consider the arrangements and the possibility of reducing the expenses for the Annual Show, having given in their report, the Committee unanimously adopt it, as a saving in the expense of about Rs. 300 will be effected without in any way affecting the completeness of the arrangements.

It was resolved that the usual subscription paper be circulated for the Prizes and other expenses.

It was resolved that the Annual Exhibition be held on Tuesday, the 12th February, and that persons not Members shall be admitted to the private view, on payment, previously by tickets, to be had of the Superintendent at the Gardens.

It was resolved to publish the following Prize List and to append the amended Regulations for competitors and visitors for general information, and that the following gentlemen be requested to favor the Society with their services as Judges in the classes to which their names are annexed :—

## LIST OF PRIZES, &c.

### Class I—.—Flowers in Pots exclusive of Annuals.

| | | |
|---|---|---|
| 1 | For the | best collection of plants, of at least 12 kinds. |
| 2 | ,, | 2nd best do. do. do. do. |
| 3 | ,, | 3rd best do. do. do. do. |
| 4 | ,, | best collection of Roses. |
| 5 | ,, | 2nd best ,, ,, |
| 6 | ,, | 3rd best ,, ,, |
| 7 | ,, | best 12 Verbenas. |
| 8 | ,, | best 6 Geraniums. |
| 9 | ,, | 2nd best ,, |
| 10 | ,, | best collection of Pinksand Picotees. |
| 11 | ,, | 2nd best do. do. do. do. |
| 12 | ,, | best show of Dahlias. |
| 13 | ,, | best collection of Violets and Heartsease. |
| 14 | | Any three plants not previously exhibited. |

Special importance to be attached to novelty and successful culture.

*Judges.*—Sir Adam Bittleston ; Col. McCally ; Revd. J. R. Macfarlane, and G. J. Shaw, Esq., M. D.

### Class II.—Annuals and Cut Flowers.

| | | | | | |
|---|---|---|---|---|---|
| 15 | For the best collection of Annuals in Pots of at least 12 kinds. | | | | |
| 16 | ,, | 2nd | do. | do. | do. |
| 17 | ,, | 3rd | do. | do. | do. |
| 18 | ,, | 4th | do. | do. | do. |

| | | | | |
|---|---|---|---|---|
| 19 | For the best collection of Cut flowers. | | | |
| 20 | ,, | 2nd | ,, | ,, |
| 21 | ,, | 3rd | ,, | ,, |
| 22 | ,, | 4th | ,, | ,, |

23* ,, best Bouquet, Vase, Basket, or Bowl of Flowers, arranged so as to display taste in assortment of colors. (Vide Regulations for Exhibitors.)

N. B.—When more than one prize is offered for the same description of flowers, no exhibitors can obtain more than a single prize in that Department.

*Judges for Annuals.*—Col. Simpson, W. E. Cochrane, Esq., Col. Barrow, Col. R. Hamilton and C. Dale, Esq.

*Judges for Cut Flowers.*—Hon'ble W. A. Morehead, Esq., Col. Black, A. M. Ritchie, Esq., Brigadier Whistler, and Revd. J. Ruthven Macfarlane.

### Class III.—Vegetables and Fruits.

| | | | | |
|---|---|---|---|---|
| 24 | For the best basket of European vegetables. | | | |
| 25 | ,, | 2nd | ,, | ,, |
| 26 | ,, | 3rd | ,, | ,, |
| 27 | ,, | best Asparagus. | | |
| 28 | ,, | ,, | Potatoes. | |
| 29 | ,, | ,, | Sweet Potatoes. | |
| 30 | ,, | ,, | Yams. | |
| 31 | ,, | ,, | Celery. | |
| 32 | ,, | ,, | Cauliflower. | |
| 33 | ,, | ,, | Brocoli. | |
| 34 | ,, | ,, | Cabbages. | |
| 35 | ,, | ,, | Knol Khol. | |
| 36 | ,, | ,, | basket of Dessert Fruit. | |
| 37 | ,, | ,, | Grapes. | |
| 38 | ,, | ,, | Strawberries. | |

*Judges.*—Hon'ble E. Maltby, Esq., Rev. Dr. Murphy, Dr. Cornish and H. Newell, Esq.

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* A few ornamental baskets are available for competitors for this Prize.

## CLASS IV.—FOR MARKET GARDENERS.

39 For the best basket of European vegetables.
40 „ 2nd „ „
41 „ 3rd „ „
42 „ best vegetable marrow.
43 „ „ Cucumber.
44 „ „ Grapes.
45 „ „ Beet-root.
46 „ „ Celery.
47 „ „ collection of fruits for dessert.
48 „ 2nd „ „
49 „ best Pommalo.
50 „ „ new description of Chillies.
51 „ „ Figs.
52 „ „ Arrowroot.

*Judges.*—R. P. Harrison, Esq., Colonel Colbeck, A. J. Scott, Esq., M. D., J. D. Sim, Esq., and J. Vans Agnew, Esq.

## CLASS V.—SPECIAL PRIZES.

53 For the best 3 Annuals not previously exhibited.
54 For the best Ægle Marmelos (BÆL Fruit).
55 For the best specimens of "*Nature Printing*," the cost of apparatus to be specified.
56 For the best collection of articles of ornamental use for Parks and Gardens.
57 For any new Fibre not before grown in this Presidency.

The producing plant and the dressed Fibre to be both exhibited.

*Judges.*—Arthur Hall, Esq., W. R. Arbuthnot, Esq., Colonel McGoun, and Dr. Mudge.

The special attention of Exhibitors and of the Members of the Society is requested to the following Regulations for Competitors and Exhibitors.

## REGULATIONS FOR COMPETITORS.

1st. All articles for competition must arrive at the Gardens by 8 o'clock on the day of Exhibition, accompanied by a sealed letter

addressed to the Secretary, containing a list of the articles sent with the following certificate. (Except in the case of prize No. 23.)

"I hereby certify that the *Plants*, *Flowers*, *Fruits*, &c. (as the case may be) sent by me for competition, have been under my care for the last two months."

2d. It is to be distinctly understood that all plants are to be in flower, and all fruits and vegetables fit for the table.

3d. No articles sent for Exhibition are to be removed until 3 o'clock, and they are then to be removed in such order as may be directed by the Secretary or the Superintendent.

4th. The Judges will meet at ¼ past 9 o'clock to award Prizes before the opening of the Meeting to the public.

5th. The Judges in any department, may withhold a premium altogether, if specimens of sufficient merit be not brought forward.

6th. Parties forwarding articles for Exhibition, *and not for competition*, will be kind enough to send information to that effect to the Superintendent, Mr. Robert Brown.

7th. Persons desirous of sending stands or table for their own specimens, are requested to do so before 4 o'clock on the previous evening. The Superintendent of the Gardens will then receive them.

8th. Exhibitors shall not be entitled to a prize for more than two consecutive years for any plants, flowers, fruits, &c. of the same variety, nor for any article of the same kind, but they shall be entitled to their honorary place in the published prize list, according to the merit of the articles exhibited.

## Regulations for Visitors.

Upon the occasion of the last Show, it was determined that, as admission tickets were for the first time required, a liberal distribution of these should be made to persons not Members of the Society.

For the future, however, this will not be done; and the following rules will be strictly enforced.

1. The exhibition will be open for the "Private View" from

10 A. M. until one o'clock and admission between these hours will only be granted to holders of *Committee tickets.*

2. The exhibition will be opened to the public without restriction from one o'clock till three when all visitors are requested to withdraw.

3. Members of the Society shall be entitled to *Committee tickets* gratis for their families and guests at their houses.

4. Persons *not Members* of the Society may also obtain admission to the private view by purchasing tickets which may be obtained from the Superintendent at the gardens, the week previous to the Show. Single tickets Rs. 1. Family tickets Rs. 2.

5. It is requested that Members will not solicit tickets for residents in Madras, who can secure to themselves the privilege of admission under the preceding rule and to whom the Gardens are freely opened on all ordinary occasions.

6. The Committee will have much pleasure in placing extra tickets at the disposal of Members who contribute to the Exhibition Fund.

A. McCally, *President.*
J. Ruthven Macfarlane, *Hony. Secy.*

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## ANNUAL EXHIBITION ON THE 12TH FEBRUARY 1861.

### Agri-Horticultural Gardens.

The great Annual Fete of the Madras Horticultural Society came off yesterday with a success and eclât surpassing even the successes of former years. The tasteful decorations, the shady arcades and the cool grottoes brought up the memory of pleasant days at Chiswick and the London Botanical Gardens. This fete is the one *promenade matinee* of the year in Madras, and Society is under infinite obligations to the Committee for affording it such a pleasant break to the dull monotony of our Indian life. The alterations in the arrangements introduced by the present Secretary were, as we expected, eminently successful. The sale of Tickets at a moderate price is a fair test of the appreciation by the public of such a fete. We have heard of people rushing about

wildly the previous evening in search of tickets, which by that time were at a premium. The few that were retained in the hands of the Superintendent were speedily sold in the morning at the gate. No doubt there were a few who made various but we are glad to say, ineffectual attempts to obtain surreptitious admission, some pleading position, some poverty and others the colour and the cut of their coat, but the police *Cerberus* while discharging his duty courteously to all was deaf to either grovelling or grandiose appeals. By 11 o'clock the leafy bowers were thronged with all the beauty and fashion of Madras, but from the extended accommodation and the various improvements in the arrangements there was at no time either crowding or inconvenience. By the excellent Police arrangements, the crowd of natives who in time past used to obtain surreptitious entrance over rails and through hedges, and formed a dark, steaming and unpleasant fringe round the tents and awnings, overpowering even the sweetest gifts of Flora were turned out and kept out. Under the management of two intelligent and active Inspectors assisted by several European Serjeants and a strong body of police, the grounds were kept clear within and surrounded by a *cordon* of peons without. The arrangements as to the refreshment department were also judicious though perhaps some of our younger readers may not quite concur with us. But we think it is scarcely a legitimate expenditure of the Society's Funds to squander hundreds of Rupees on ices and Bon-Bons, especially on large numbers whose only support to the Society has been, their annual attendance at the fete and their liberal eating of gratuitous ices.—Altogether we are sure we speak the minds of the hundreds who were present at the Gardens yesday, when we say that the Committee and all concerned deserved the hearty thanks of the society of Madras for the pleasing and interesting fete they have provided for the public.

As to the exhibition itself, in many respects it surpassed that of any former year. The shew of vegetables was really magnificent and would have done no discredit to Covent garden. And this is all the more surprising and also the more creditable considering the very unfavorable season. The flowers especially the roses, almost as a matter of course from this cause, were not up to the standard of last year. The cut flowers, however, were really splen-

did. Col. Colbeck's table presented a gorgeous and varied array of beauty, containing, we believe, upwards of 30 varieties of roses and some of them of great rarity. In this class Mrs. Sherman carried off the first prize, between whom and Col. Colbeck there is generally a close run. Owing to some misapprehension, we believe, as to the Rules of the Society regarding the number of prizes allowed to one competitor, Col. Colbeck was not allotted that place in this list to which undoubtedly the merits of his floral contributions entitled him. There was a tameness and sameness in the Government House table which, on looking at Col. Colbeck's, we could scarcely have expected would have ranked it as second on the list.

The exhibition of fruit was particular meagre and deficient both as to quantity and quality, but this is fully accounted for by the unfavorable season.

The following is the list of prizes awarded, with the names of the successful competitors and the remarks of the Judges :—

Class I.—First Prize for the best Collection of Plants in Pots of at least 12 Kinds.

Col. Colbeck.

2nd Prize, Mrs. Sherman.

First Prize for the best collection of Roses.

Col. Colbeck.

2nd Prize, Guindy Park.

First Prize for Verbenas.

Mrs. Sherman.

First Prize for Geranium.

Guindy Park.

First Prize for Pinks and Peccotees,

Mrs. Sherman.

2nd Prize Col. Colbeck.

First Prize Dahlias.

Col, Colbeck.

First Prize Hearts ease.

Mrs. Maltby.

Special Prizes for sweet Peas.

Col. Colbeck.

*Judges.*—Sir Adam Bittleston, Col. McCally, Revd. J. R. Macfarlane, and G. J. Shaw, Esq., M. D.

CLASS II.—FIRST PRIZE FOR THE BEST COLLECTION OF ANNUALS.

Mrs. Sherman.

REMARK.—The collection of Mrs. Sherman exhibited a greater variety than any other. Phlox was decidedly superior ; but on the whole there was little to choose between Mrs. Sherman's and Col. Colbeck's lots.

2nd Prize Col. Colbeck,
3rd do. Guindy Park.

CLASS II.— FIRST PRIZE FOR CUT FLOWERS.

Mrs. Sherman.

2d Prize Guindy Park.
3rd do. Colonel Colbeck.
4th do. Sir A. Bittleston.
First Prize for the best Bouquet of Flowers.

Colonel Colbeck.

REMARK.—The Hon'ble Mrs. Maltby exhibited a small and choice collection, but the numbers shown were not in sufficient quantity to admit of the Judges awarding a Prize.

(Signed) J. W. BARROW.

*Judges for Annuals.*—Colonel Simpson, W. E. Cochrane, Esq., Colonel Barrow, Colonel R. Hamilton, and C. Dale, Esq.

Cut Flowers, the Honorable W. A. Morehead, Esq., Col. Black, A. M. Ritchie, Esq., Brigadier Whistler, Rev. J. R. Macfarlane.

CLASS III.—FIRST PRIZE FOR THE BEST BASKET OF EUROPEAN VEGETABLES.

W. E. Cochrane, Esq.

2nd Prize A. J. Scott, Esq., M. D.
3rd Prize Colonel Simpson.
First Prize for the best Sweet Potatoes.

Colonel Simpson.

First Prize for the best Celery.

Mr. A. Thomson.

First Prize for the best Cabbage.

W. E. Cochrane, Esq.

First Prize for the best Knol Khol.

J. W. Mudge, Esq., M. D.

First Prize for Strawberries.

Colonel Simpson.

Arrowroot recommended for Prize.

Onion in No. 2 recommended for prize.

Beetroot No. 10 recommended for prize.

*Judges.*—Hon'ble Mr. Maltby, Rev. Dr. Murphy, Dr. Cornish, R. H. Newill, Esq.

In giving in our report after inspection of vegetables and fruits exhibited in class No. 3, we would remark that the number of competitors appear to be fewer than in former years.

The specimens exhibited however are unusually good, both as regards quality and variety.

We regret the absence of some articles to which special prizes were to have been awarded; we beg however to recommend that those prizes be appropriated to the articles which have been substituted.

Edward Maltby.
John Cornish.
R. Murphy.

MADRAS, *Feb.* 12*th*, 1860.

N. B.—We desire also to notice a specimen of wheat grown in the "People's Park" Madras, under circumstances of no ordinary difficulty. It is highly creditable to the exhibitors.

CLASS IV.—MARKET GARDNERS.

First Prize for the best basket of European vegetables.

A. Lazarus.

2nd Prize, Francis.
3rd do. Yeesoo.
First Prize, for Beetroot.

Aungamootoo.

*Judges.*—R. P. Harrison, Esq., Col. Colbeck, A. J. Scott, Esq., M. D., J. D. Sim, Esq., and J. Vans Agnew, Esq.

CLASS V.—FIRST PRIZE FOR NATURE PRINTING.

H. Smith, Esq., Supt. Government Gazette Press.

REMARKS.—Process exhibited last year, but the present machine is improved by the addition of a spiral spring.

N. B.—Rule No. 8, for Competitors will, however, apply to this case.

First Prize for the best collection of articles for ornament and use.

A. Hunter, Esq.

REMARKS.—The Judges think No. 3 deserves credit exhibited by Coopoo Odyar.

First Prize for any new fibre not before grown in this Presidency.

REMARKS.—None especially exhibited. A very fine specimen of Bengal Cotton raised from seed from Kurnool was exhibited by Dr. J. W. Mudge grown in his garden. The Judges consider the Cotton particularly deserving of notice.

*Judges.*—Arthur Hall, Esq., W. R. Arbuthnot, Esq., Colonel McGoun, and Dr. Mudge.

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## AGRI-HORTICULTURAL SOCIETY

*Proceedings of an adjourned Meeting of the Committee of the Agri-Horticultural Society held at the Gardens on Wednesday 27th March* 1861.

PRESENT.

Colonel McCally.—*President.*

C. Dale, Esq.
J. D. Sim, Esq.
J. G. Shaw, Esq., and
J. Ruthven Macfarlane, *Hony. Secretary.*

Read the following letter from Col. Crewe, Private Secretary to the Honorable the Governor.

MY DEAR MR. MACFARLANE,—I have laid your note before Sir William Denison who desires me to say that he with pleasure accepts the office of Patron of the Horticultural Society. His Excellency will be glad to know what is the constitution and working of the Society in order that he may attend Meetings and give such farther aid as may be in his power."

Read letter from Captain Grant submitting a proposition for the reduction of the rate of Subscription for members in the Mofussil. The Committee direct Captain Grant to be informed that the subject has on more than one occasion been fully considered, and that it is not deemed expedient to make any alteration in the amount of Subscription payable by Members in the Mofussil, as all the more important advantages afforded by the Society are available for them equally with others, and that the supply of seeds alone, furnished to all Subscribers, is equivalent to more than half the Annual Subscription.

Read the following letter from Lieut Mitchell :—

Madras, *4th Feb.* 1861.

To the Rev. J. R. Macfarlane,
*Hony. Secretary Agri-Horticultural Society.*

Dear Sir,—I am making some enquiries about the arrowroot producing plants of Southern India,—of which the form of the starch granule, as exhibited by the microscope, shows there must be several kinds.

By the kindness of Colonel McCally I have been favoured with some bulbs from which the Cannanore arrowroot is said to be produced. The position of the plant in the Vegetable Kingdom is not stated, but I have reason to believe it is a species of Curcuma.

My object in troubling you is to request you will do me the favour to have some of the bulbs planted at the Society's Garden where I know they will be carefully looked after, and where the Superintendent, Mr. Brown, or some of the members, having a greater amount of Botanical knowledge than I possess, will be able to give me hereafter the correct name of the plant.

You will observe that the Cannanore arrowroot is supposed to be all produced from one species of plant,—but if there be, as I believe there is, an invariable* form in the starch of the same species of plant, this certainly cannot be the case, and as it is as-

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* Note.—The granules are not entirely of the same form in the same starch, but there are certain forms which appear to be constant in the species.

sumed that certain starches sold as arrowroot are much inferior to others, it becomes a matter of some consequence to ascertain which plant produces the best kind. The " Muranta arundinaccæ" as you I dare say know is said to be the true West Indian Arrowroot plant.

This subject has attracted attention in England by Mr. Hassall's exposures of the adulterations practiced upon this article of food. He states that the East Indian Arrowroot is the production of Curcuma angustifolia, one of the Zingeberaceae. There were ten samples of Arrowroot in the last Madras Exhibition of Raw produce, and the form and optical properties of the granules are very varied, though all if I remember rightly, were sent from Cannanore.

I have only further to add to this, that if any Arrowroots so called, are growing in the Society's garden I shall be very glad to have an opportunity of examining the starches. For this purpose an offshoot from a root, not larger than my little finger, will be an ample supply. I would prefer preparing the starch myself.

I am dear Sir,

Your most obedient servant,

J. MITCHELL, *Lieut.*

Resolved that the Superintendent be instructed to afford every facility and assistance to Lieutenant Mitchell in pursuing his investigations.

It was resolved to notify to the members that a small supply of Egyptian cotton seed is available, and that those who may desire in the present aspect of the Cotton market to make experiments may obtain a small quantity on application to the Superintendent.

It was resolved also to notify to subscribers and others that a quantity of Lucerne may be had from the Superintendent who is prepared to supply it fresh daily at 6 annas per bed to Members and 8 annas to Non-subscribers, and further that a supply of Lucerne seed is now in hand which may be had on application.

Read letter from Colonel Pears requesting a remission of his arrears of subscription on the ground of his having been under the impression that Members in the Mofussil paid no subscription.

Resolved that Colonel Pears be informed that the Committee regret their inability to comply with such a request, there being no differential rate provided by the Rules of the Society for its Members, and further that Colonel Pears be reminded that he freely accepted of all the benefits of the Society for the past year.

Read Extract from the Proceedings of Government :—

Revenue Department.

Read the following Telegraphic Message from Mr. McIvor, to the Secretary to the Government of Fort Saint George, Madras, dated Ooty, 22d March 1861 :—

Yesterday received Government Order of 9th, number five hundred and fifty-two. Red bark seeds arrived, ground cannot be prepared at Neddivattam for two months. This delay endangers their vitality. Solicit orders for their disposal.

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Order thereon, 22nd March 1861, No. 680.

Mr. McIvor will be informed that the Government must leave it to him to do the best that he can with the seeds. They wish him to retain a certain quantity; also to send some to Mr. Brown at the Horticultural Society's Garden Madras, some to the Superintendent of the Government Garden at Bangalore, and to distribute small quantities also to a few Coffee Planters in Coorg or elsewhere who may be willing to try them. Thus various soils and climates will be tried.

(True Extract)

(Signed) J. D, Bourdillon,
*Secretary to Government.*

Resolved that Mr. McIvor be requested to forward a few of the Cinchona seeds for the following Members of the Society who are in comparatively favorable situations for making attempts to cultivate the plant.

C. Pelly, Esq., for trial on Ramandroog.
C. Fane, Esq., for trial on the Galaparvatum Hills.
H. V. Levinge, Esq., for trial on the Pulney Hills.
J. Ouchterlony, Esq.
J. Rohde, Esq.

His Highness the Rajah of Vixianagram.

G. F. Fisher, Esq., for trial on the Shevaroy Hills.

Those gentlemen who are residing on the Neilgherry Hills to be supplied direct, the others to be supplied through the Superintendent of this Society.

Dr. Mudge was unanimously elected a Member of the Committee and the following gentlemen were elected members of the Society.

The Rev. Thomas Dealtry.
Leander Miller, Esq.
John Miller, Esq.
Dr. Furnell,
S. Short, Esq.

The Committee acknowledge with thanks the receipt of the following publications.

1. Annual Report of the Government Botanist and Director of the Victoria Botanical and Zoological Garden.

2. Report by Surgeon J. Lalor on the Hill Districts to the South West of Mehur in Sind.

3. Report of Horticultural Society of the Gironde.

A. McCally, *Chairman.*
J. Ruthven Macfarlane, *Hon. Secy.*

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## Agri-Horticultural Society.

*Proceedings of a Meeting of the Committee held in the Gardens on Wednesday the 23rd April* 1861.

PRESENT.

Col. McCally.—*President.*

A. J. Scott, Esq.
Dr. Mudge.
Amir Ud Dowlah, Bahadoor,
Revd. J. Ruthven Macfarlane, *Honorary Secretary.*

MEMBER.

R. S. Ellis, Esq., C. S.

A Sample of Cotton grown from Egyptian Seed at the Rosenbaugh, near Sydapet, was laid on the table with a report obligingly furnished by C. Ainslie, Esq., of Messrs. Binny and Co.

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My Dear Mr. Macfarlane,—The sample of Egyptian Seed

Cotton you this morning sent me, has been examined, and I have much pleasure in sending you the following particulars respecting it. The Cotton is of good quality and of fair color, though slightly stained. The Fibre is woolly, but the staple good, although much shorter than the Cotton grown in Egypt. The demand for this description of Cotton is limited, as it is principally used in the manufacture of the finer numbers of yarn say 80s. to 100s.

The last quotations we have received for Egyptian Cotton are 7d. to 8¼d. for ordinary and middling and 9¼ to 11d. per lb. for good and fine. The Sample you sent is valued about 6d. to 6¼ per lb. The Imports of Egyptian Cotton into the United Kingdom amounted in 1860 to 110,007 bales.

Believe me,
Yours sincerely,
C. A. AINSLIE.

MADRAS, *5th April*, 1861.

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Two Samples grown at Chingleput were also produced along with the following letter from Dr. Short and the Report of Mr Ainslie.

CHINGLEPUT, 18*th April*, 1861.

*To the Secretary to the Agricultural and Horticultural Society of Madras.*

SIR,—I have the honor to forward Samples of Cotton grown at Chingleput, and beg to request that you will be pleased to lay the same before your Society.

No. 1, is that of Cotton grown in Betel Gardens on *Nunjah* or wet land, where the soil is a loam, the plant being cultivated with the object of giving shade and support to the Betal vine. I cannot clearly trace how long this Cotton has been cultivated by Betel growers. I have traced it at least, to the beginning of the present century, and as the plant cannot be indigenous to Southern India, its similarity to the Egyptian Cotton, leads me to believe that it may be the same introduced by Dr. Anderson in 1790, under the name of Bourbon Cotton, and in 1793, Dr Roxburgh stated that it thrived better at Coromandel than at Bengal. Vide Dr. Royle's "Reproductive Resources of India," 1840, Page 340.

I believe the Egyptian and Bourbon Cotton to be the same, the difference in name arising from the localities in which they were originally cultivated.

No. 2. Is Cotton grown at Chingleput, on soil chiefly composed of decaying Granite. The plants were cultivated by Captain Templer from seeds procured direct from *Cairo.*

I send of each sample cleaned as well as cotton in pods.

I have the honor to be, Sir,
Your most obedient servant,
JOHN SHORT, M. D.
*Zillah Surgeon.*

P. S.—Acclimated seeds, of the cotton grown by Betel Gardeners, are procurable here at 4 annas the pound.

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MADRAS, 23*rd April* 1861.

MY DEAR MR. MACFARLANE,—It is rather a difficult task you have given me to report upon the two samples of cotton you sent over this morning, as but little of such cotton is shipped from this. However, after having the musters carefully examined, we think the following may be considered as a fair description of them.

No. 1. Very good colour and staple, much like Bourbon seed cotton probable value 6*d.* per lb.

2. Good color, but not of such good staple as No. 1. Fibre rather hard. Similar to Tinnevelly cotton. Probable value 5¼ per lb.

Herewith I return the samples and

I remain,
Your's sincerely,
C. A. AINSLIE.

The Committee are under obligations to Mr. Ainslie for his kindness, and they consider his report as very hopeful and encouraging for the extended and successful cultivation of cotton along the Seaboard.

The Superintendent stated that he had a considerable quantity of Bael fruit ripening and on hand which Dr. Sanderson had requested him to reserve for public Hospital use, as being most valuable in cases of Dysentery.

Resolved that after Members who might apply had all been supplied with a reasonable quantity, the remainder might be placed at the disposal of Dr. Sanderson.

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Read the following letter from Major Hervey, Commanding H. M. 40th Regt. M. N. I.

*To the Secretary Horticultural Society, Madras.*

DEAR SIR.—It being in contemplation to establish vegetable gardens in the Regiment under my command at the station, for the purpose of not only raising good vegetables for the use of the men, but with a view to the introduction of healthful occupation and exercise and thus keeping them out of the bazaars and spirit shops, &c., &c., in the Town, I have the honor to request you will so far assist me, as to send me by the first favorable opportunity, a good supply of seed of all kinds of country vegetables of the best description, such as you know are peculiarly adapted for the consumption of the Sepoys, and which are not easily procurable at this place.

We have got our garden near the men's barracks in tolerable working order, and this has induced them to express a wish to have each a garden per company, and as vegetables form an ingredient in their diet I am desirous of encouraging them in so laudable an undertaking, and I am sure that you will kindly enter into my views and give the undertaking your cordial co-operation and assistance.

I have the honor to be, dear Sir,
Your most obedient servant,
A. HERVEY, Major,
*Comdg. H. M.'s 40th Regt. M. N. I.*

P. S.—I am certain His Excellency the Commander-in- Chief would approve of the scheme as praiseworthy and deserving of support and encouragement. A few flower seeds, such as balsams, marigolds and such like would also be most acceptable.

Brinjalls and Peekincoi, Bandicoi, Poodlincoi, Bazee, Onions, Radishes, Turnips, Carrots, French beans, Broad beans, Chillies,

Cucumbers, Cuddoo, Pumpkins. Lettuce, and any others you may think fit to add, are the vegetables I would be glad to have.

A. H.

SINGAPORE, *7th April*, 1861.

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Resolved that Major Hervey's application be complied with, the seeds to be forwarded through the Quarter Master General's Department.

The Committee acknowledge with thanks the offer of Mr. Fischer of Salem to forward tea seeds and plants ; they fear, however, that the attempt to grow or cultivate them in the Madras gardens would be hopeless.

The Accounts of the Annual Shew of 1861, were examined and passed. The receipts were Rs. 572 and the expenditure Rs. 520-0-8 shewing a balance in hand of Rs. 51-0-8. In consequence of the not unfrequent failure of some of the European vegetable seeds and their apparent delicacy, it was resolved to procure for distribution in addition to the usual supply from England, a quantity of seeds from various Stations where they had become more hardy and naturalised. It was resolved also in consequence of the difficulty experienced by many Members in obtaining extra supplies of Seed peas, that the Superintendent be authorised to procure, in addition to the quantity required for the usual gratuitous issue, a sufficient supply for sale to meet the wants of the Subscribers.

Samples of the Chinese Sugarcane (S*orghum* S*accharatum*) grown in the new Garden with considerable success were shown by Mr. Brown. The Committee desire to bring this useful plant to the notice of the members. The experimental sowing received no extraordinary care, yet it grew freely and luxuriantly to the height of 8 and 12 feet and was very prolific. The tops are used for feeding the cattle, the Stem for making Syrup or Sugar, and the seed may be used for the same purposes as cholum, which it somewhat resembles. Members may have a small supply of seed on application to the Superintendent.

The Superintendent was directed to affix lables with the popu-

lar and scientific name to all the most important trees, shrubs and flowers in the Gardens.

The Committee resolved to publish for the information of the Members and the public the following List of Prizes to be awarded at the Annual Show to be held in February 1862.

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## ANNUAL EXHIBITION, FEBRUARY, 1862,

## PRIZE LIST.

### Class I.—Flowers in Pots exclusive of Annuals.

For the best collection of plants of at least 12 kinds.
,, ,, 2nd best ,, ,, ,, ,,
,, ,, 3rd best ,, ,, ,, ,,
For the best collection of Roses.
,, ,, 2nd best ,, ,,
,, ,, 3rd best ,, ,,
For the best 12 Verbenas.
,, ,, best 6 Pinks and Carnations 3 of each.
,, ,, best 12 Dahlias.
,, ,, best 3 pots of Violets (Viola odorata.)
,, ,, best 3 pots of Heartsease (Viola tricolor.)
,, ,, best collection of Ferns.
Any new plant not previously exhibited.

### Class II.—Annuals and Cut Flowers.

For the best collection of Annuals of at least 12 kinds.
,, ,, 2nd best ,, ,, ,, ,,
,, ,, 3rd best ,, ,, ,, ,,
For the best collection of Cut Flowers.
,, ,, 2nd best ,, ,, ,,
,, ,, 3rd best ,, ,, ,,

For the best Bouquet, Vase, Basket or Bowl of Flowers, arranged so as to display taste in assortment of colours. (Vide Regulations for Exhibitors).

### Class III.—Vegetables and Fruits.

For the best collection of European Vegetables.
,, 2nd best ,, ,, ,,
,, 3rd best ,, ,, ,,

For the best 6 Celery.
,, best 6 Cauliflower or Brocoli.
,, best 6 Cabbages.
,, best 6 Knol Khol.
,, best Potatoes.
,, best 6 Beet Root.
,, best basket of Jerusalem Artichoke.
,, 6 best Lettuce.
,, best basket of Dessert Fruit.
,, best 3 Pine Apples.
,, best basket of Fruit grown on high lands in Hill Stations of at least 4 kinds.
,, best Sapodillas.

### Class IV.—For Market Gardeners.

For the best basket of European Vegetables.
,, 2nd best.
,, 3rd best.
,, 3 best Vegetable Marrow.
,, 6 best Cucumber.
,, 6 best Beet Root.
,, 6 best Celery.
,, 6 best Knol Khol.
,, 6 best Lettuce.
,, best basket of Dessert Fruit.
,, best Pummalo.
,, best Figs.
,, best Sapodillas.

### Class V.—Special Prizes.

Best Specimen of Cotton grown in the Carnatic of not less than hundred pounds, to be accompanied with a Memorandum showing description of Seed, mode of cultivation, and estimated extent of return per acre or per plant.

A. McCally, *Chairman.*
J. Ruthven Macfarlane, *Hony. Secy.*

## Proceedings of the Madras Photographic Society.

*A Meeting of the* Photaoraphic Society *was held at the School of Arts on the 5th December* 1860.

Colonel Hamilton in the Chair.

PRESENT.

Messrs. Mitchell,
,, Hunter,
,, McCally,
Messrs. Flynn and
,, Scott.

Resolved that the Exhibition advertised to be opened on the 6th instant, be postponed to Thursday the 20th, to admit of several contributions, which are still expected being received.

Resolved that in addition to the medals already announced for competition, a prize be awarded to the best contribution to the Exhibition exhibited by any Native Photographer.

Resolved that the following Gentlemen be requested to form a Committee to carry out the necessary arrangements connected with the Exhibition ; Dr. Hunter, Dr. Scott, Captain Mitchell, Mr. Crake and Colonel Hamilton.

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## The Photographic Exhibition.

The Exhibition of the Madras Photographic Society was opened to the public on the 20th December 1860. Among the pictures exhibited this year are some of great interest and a few of perhaps the finest specimens of Photography ever produced. One of the novel features in this year's display is that it combines great variety, embracing samples of almost every branch of the art, and from a number of different countries, as China, Bengal, Madras, Bombay, Aden, Egypt, France, Italy, Switzerland, England, Scotland, Ireland, and Australia. Another very interesting feature in the Exhibition has been that some large and valuable collections have been lent, and that there has been so constant a supply of fine Photographs on loan, that almost every fortnight a change has been made in the pictures, some having been lent for only a few days. Amongst the contributions thus lent for only a few days was a collection of upwards of 70 well selected views from Cash-

mere, Delhi, Agra, Lucknow, Central India, Bombay, Aurungabad, and Elephanta, with excellent groups of Indian figures in easy and natural attitudes. This valuable series was collected by an English gentleman of taste, F. Cheetham, Esq., who is now travelling in the East and who kindly lent his portfolio for two or three days, and made some extensive purchases of Photographs taken in this Presidency by Captain Tripe and Mr. Nicholas. Those who had the pleasure of seeing this collection were much struck with the taste and judgment evinced in its selection. To give an adequate idea of the variety and beauty of many of the pictures would occupy too much time, so we must attempt a description of some of the best still on view at the School of Industrial Arts.

Among the landscapes is a series of 16 large views at Ootacamund, printed from Collodion negatives by Col. Ross. The atmospheric effect in some of these is well rendered, and there is a great look of nature about them; but the subjects would have looked more picturesque had the Camera been placed nearer the ground, so as to show more sky and less of uninteresting foreground and low middle distance in bad perspective. The result of this error has been to give an insignificant effect to the hill scenery, from all the objects having been looked down upon. Photographers are apt to overlook this simple rule, which is applicable to almost every branch of the Art, and may be epitomized in the following pithy words. If you want to give importance to a figure or a landscape, view it from below, with plenty of sky to set it off. Get above an object or figure, and look down upon it and it immediately looks insignificant. Some of the beautiful views in Scotland, Wales, and the Pyrenees, in other collections, show the importance of avoiding high points of sight.

The Photographic manipulation and the focussing in Colonel Ross's views, are excellent with one exception, which has been judiciously withdrawn, as some figures that were introduced below the line of horizon spoilt the effect, and were out of focus, from the figures having moved. To those who have visited the Neilgherries these photographs recall pleasing reminiscences of the localities, and it has afforded great amusement to hear how

parties have been able to identify every house, and road, and each nook and corner represented. The most picturesque subjects are the views of the Hills on the road leading to Coonoor. The new Lawrence Asylum with the lads at play, and at gymnastic exercises, is also interesting, but some of the boys have moved.

It is a pity that Mr. Nicholas did not exhibit his collection of similar views on a smaller scale, taken recently at Ootacamund. Some of them were exceedingly good.

Mr. Rohde exhibits two very good views at Ootacamund printed from Collodion negatives taken by Mr. W. Scott. One of these is a view of the Church and Burying ground well focussed and printed; the other is a view of Mr. Rohde's house. In these the horizon has been kept lower than in Colonel Ross's, and the pictures being of a long instead of a square shape, the effect is more pleasing. There are a few defects in the sky, but the toning and printing are admirable. We are informed that sets of 6 of these can be purchased for Rupees 30.

Mr. J. Lafond exhibits some interesting stereographic and other groups, and a view of Vizagapatam from the back-water. Amongst the groups is one of the American Mission School children with Mrs. Winslow and some of the Native Teachers. Two of the family groups by this exhibitor are good, but the Native woman with a basket on her head intended as the model for a caryatide, is by no means a favorable specimen of an Eastern figure.

It may interest the public to know that a considerable stimulus has been given to the Art in Madras during the past few months by the excellence and variety of the pictures exhibited. The number of visitors to the Exhibition appears to be yearly on the increase, particularly amongst the Hindoos, many of whom take a lively interest in the pictures, and one feature of importance that has been remarked this year is that on the occasion of holidays and native feasts, crowds of well dressed and picturesque groups of natives have visited the rooms. On some days there have been from 1,500 to 1,800 visitors.

To resume our notice of the pictures we may mention that W. H. Crake, Esq., exhibited 17 large Photographs taken from na-

ture by the wax paper process, among these were several excellent views of Pagodas, Stone carvings and antiquities at Mahavellipooram or the Seven Pagodas near Sadras. One of these a tall Mundapum on four elegant pillars, has been selected by the Council of the Photographic Society for distribution amongst the Subscribers of this year. A group of Palmyra Trees,—a small Pagoda amongst Palm Trees, and a clump of Cocoanut Trees, were all considered excellent specimens of Photography and interesting as good characteristic Botanical representations of Trees.

Dr. Fitzgerald exhibited nine very interesting views in Bengal, taken when in camp with the Field force at Lucknow and Cawnpore. Of these we may notice the Allumbaugh Gateway and Palace, Wheeler's entrenchments, Nana Sahib's slaughter house at Cawnpore, and the site of Havelock's grave between two trees in the Garden of the Allumbaugh Palace.

Captain J. H. Shaw Stewart, exhibited 23 very interesting Photographs from China, taken by Signor Beato. The subjects were chiefly views of Forts and localities captured by the Allied Forces during the recent campaign. Among these we may mention as of peculiar interest,—The Emperor's Palace at Pekin, Talien Whan Bay, a large Panorama of Kowloon nearly 9 feet in length, a panorama of Tangkoo and the landing place off the Taku fort. The portraits of Lord Elgin, the Prince of Kung, brother of the Emperor, Sir Robert Napier, and a group with Lord Clyde, Sir Hope Grant and Sir William Mansfield, which we believe are by the same Artist, are very indifferent specimens of Portraiture.

Captain Girdlestone exhibited 20 Photographic views taken by theCollodion-Albumen or Tabenot's process toned by the Alkaline bath of Gold without any acid ingredient. Also one very excellent group of Tamarind Trees by the Oxymel process.

The subjects of these Photographs are views at the Gairsoppa Falls and in the Western Ghats. These though excellent in focusing and manipulation, fail to convey an idea of the grandeur of the scenes represented. The Committee of the Photographic Society were very much pleased to remark the steady improvement made yearly by Captain Girdlestone, but on comparing his photographs with those by Col. Ross of Her Majesty's 73rd Regt.,

they came to the unanimous opinion, that those by Col. Ross were the best, as well as the largest exhibited, and entitled to the first prize. The second prize for Landscapes was awarded to Captain Girdlestone, 11th Regt. M. N. I.

E. H. Butcher, Esq., exhibited 12 Photograshic prints from Callotype negatives, the subjects being chiefly views of Pagodas near Mysore ; the best are No. 2 Temples upon Indrabetta, No. 3 the Alasoor Pagoda and No. 6, the Brasava Temple near Bangalore. The lights in some of these are rather too white and the shadows black, but this is an obstacle that nearly all Photographers in India have to contend with, arising from the intensity of the sun's rays.

Photographic portraits.—One of the most attractive contributions to the Exhibition was a collection of upwards of 70 portraits of the residents in Madras, taken by Dr. A. J. Scott, Honorary Secretary to the Society. We believe it was Dr. Scott's original intention to have confined his efforts to the portraiture of his Medical brethren, but the demand for portraits became so great, that numbers from all ranks of Society began to apply for their likenesses, and a stimulus was thus given to the Art that will probably prove beneficial, as Dr. Scott not only took many good likenesses of the leading members of Society but also communicated freely his knowledge of the processes and details by which his pictures were produced.

### Stereograms.

A very large and interesting collection of 54 Stereograms was contributed by Capt. A. N. Scott of the Madras Artillery. The subjects consisted of groups of Native figures, Antiquities, Bazaar scenes, Tombs and Native trades with a few representations of Artillery drill and ordnance. This is unquestionably the best collection of stereograms that has yet been produced in Madras, and possesses the qualities of clear focusing and printing, tasteful selection of subjects and careful manipulation and mounting. The first prize for Stereograms was awarded by the Committee to Captain A. N. Scott.

Mr. Nicholas exhibited 23 Stereograms chiefly views about Ma-

dras. These are well focused, clearly printed and the subjects of many of them picturesquely selected. The Collodion Negatives from which these were printed, were all taken by the Fothergill dry process. The best subjects were the Cornwallis statue, St. Mary's Church, the Cathedral, Vepery Church, and two Mahomedan Tombs in Triplicane. The view of Madras from the top of the Light house and of Messrs. Arbuthnot and Co.'s Office on the beach were also considered good. The second prize for Stereograms was awarded by the Committee to Mr. Nicholas.

Lieutenant Colonel Ross exhibited good Stereograms, three of them views at Ootacamund—one at Benares, an excellent likeness of the late Chief Justice Sir H. Davison, and a group of 20 figures, nearly all clearly focused and the likenesses easily recognizable. Colonel Stevenson exhibited 40 Stereograms chiefly bazaar scenes and landscape scenery about Quilon, Travancore and the west coast. Many of the subjects were very picturesque,and the points of view well selected, but the Chemical manipulation was not so good, as in those exhibited by Captain Scott and Mr. Nicholas; the lights being very white and the shadows too heavy in some of the pictures.

One of the largest contributors to the Exhibition, was C. Iyahsawmy, Photographer in the School of Arts and lately Photographic Assistant to Captain Tripe, while Government Photographer. The best of his contributions were two views of the Scotch Church, one of a Pagoda at Vepery, and three of the diving and dredging apparatus on the Island. These were taken by the waxed paper process. 38 studies from casts of statues, hands and feet and ornaments in the School were also taken by the same process, and 16 copies of prints by the wet collodion process; some of these were pronounced to be very good. A few copies of pen drawings by the latter process were also printed well and some of the above have been selected as useful studies for drawing schools. During the exhibition Iyahsawmy was kindly taught by Dr. A. J. Scott, to take likenesses, to print and to tone portraits by the collodion process and he has been enabled to theac others who have applied for instruction at the School of Arts.

The following Photographs which have been distributed to the

subscribers to the Photographic Society were also laid on the Tables. 1 Ulsoor Pagoda. 2 The Duke of Wellington, 100 gun ship. 3 A Mahomedan Mosque. 4 Shevagunga Hill. 5 Large Pagoda with Tank. 6 A stone car at Humnee. 7 A statue of Hunnamaon. 8 Portrait of Brigadier Neill. 9 A group of Palmyra Trees. 10 Portrait of Lord Harris. 11 A Mahomedan Mausoleum. 12 Portrait of Sir Christopher Rawlinson. 13 Faust and Marguerite after Ary Scheffer. 14 Statue of Ganesa. 15 Ruined Pagoda overgrown by a Banian Tree. 16 St. Mary's Church in the Fort, Madras.

Two very fine prints were also received for distribution amongst the subscribers for this year, one of the Piece of plate presented to the Madras Fusiliers by the community of Madras as a tribute to the Memory of the late General Neill, and the other a portrait of the Honorable Walter Elliot. A complete set of Capt. Tripe's Photographs and Stereograms were exhibited and 96 good European Photographs with 64 picturesque European Stereograms were also exhibited by Dr. Hunter. Some of these were the prize Photographs of the Exhibitions of 1858 and 1859, in Edinburgh London, and Paris, and the choice pictures of the Artists and Stereographic Society of London.

The total number of pictures exhibited this year has been 1,732 and the result has been that a great stimulus has been given to the Art of Photography in Madras.

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*Meeting of the* Photographic Society 21*st March* 1861.

PRESENT.

Colonel McCally in the Chair.

| | |
|---|---|
| Colonel Hamilton, | Captain Mitchell, and |
| Dr. Hunter, | Dr. Scott. |

Prints of Mr. Elliot, and the Neill Testimonial laid on the table and the bill for the same submitted to the Meeting.

Resolved that the bill be paid.

Resolved that Mr. Crake be asked to give up a negative of one of the Seven Pagodas for distribution.

Proposed that Dr. Hunter, Mr. Crake and Mr. Cochrane be asked to form a Committee to decide the prizes for 1859-60.

The following Gentlemen were elected Members of the Society.

Dr. Fitzgerald.
Mr. Poulain of Pondicherry.

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*April 10th* 1861.

PRESENT.

Colonel McCally in the Chair.

Dr. Hunter and | Dr. Scott.

Sanction for payment of Dr. Hunter's bill for expense connected with the late Exhibition.

Dr. Hunter stated that the Committee appointed to adjudicate the prizes for the late Exhibition decided as follows:—

| | | |
|---|---|---|
| First prize for views | ......... | Colonel Ross. |
| 2d | ditto .............. | Captain Girdlestone. |
| First for Stereograms | ......... | Captain A. N. Scott. |
| 2d | ditto............... | Mr. Nicholas. |

The model of the medal hitherto given was submitted by the Secretary, which was pronounced capable of being improved, and it was resolved to defer settling the matter until Dr. Hunter inquires whether this can be done.

Read letter from Captain Scott relative to the request that he should place some of his stereo negatives at the Society's disposal for distribution.

The Secretary intimated that Mr. Crake declined to give the negatives selected, but offers some Stereograms.

Resolved that Mr. Crake should be requested to submit the Stereograms.

*Extract from Meteorological Observations kept at Madras Observatory, Daily Means.*

**APRIL 1860.**

| Date. | Barometer reduced to 32° Faht. | Thermometers. Means. Dry. | Thermometers. Means. Wet | Thermometers. Maxi | Thermometers. Mini. | Wind. | Rain. | REMARKS. |
|---|---|---|---|---|---|---|---|---|
| | Inches | ° | ° | ° | ° | | Inches | |
| 1 | 29·825 | 85·0 | 79·2 | 92·5 | 79·1 | E S E | ...... | Clear. |
| 2 | ·838 | 85·2 | 79·5 | 94·1 | 79·1 | S S E | ...... | Hazy. |
| 3 | ·836 | 85·0 | 79·8 | 94·3 | 79·6 | S S E | ...... | Overcast. |
| 4 | ·828 | 84·8 | 79·5 | 93·3 | 79·0 | S E | ...... | Cloudy. |
| 5 | ·821 | 85·6 | 79·6 | 93·5 | 79·1 | S by E | ...... | Do. |
| 6 | ·811 | 83·9 | 78·6 | 90·5 | 77·3 | S E | ...... | Do. |
| 7 | .... | .... | .... | 91·8 | 75·0 | | | |
| 8 | ·742 | 84·0 | 77·8 | 92·3 | 78·0 | N by W | ...... | Overcast. |
| 9 | ·707 | 84·9 | 77·3 | 95·4 | 78·3 | N by E | ...... | Do. |
| 10 | ·718 | 87·5 | 79·6 | 99·7 | 79·4 | ? | ...... | Hazy. |
| 11 | ·766 | 88·0 | 80·1 | 98·7 | 80·1 | S by E | ...... | Clear. |
| 12 | ·800 | 88·0 | 80·4 | 100·9 | 81·6 | S | ...... | Do. |
| 13 | ·813 | 87·2 | 79·3 | 96·1 | 81·6 | S | ...... | Do. |
| 14 | .... | .... | .... | 90·4 | 80·1 | | | |
| 15 | ·880 | 85·6 | 78·7 | 93·7 | 78·8 | S S E | ...... | Do. |
| 16 | ·875 | 84·8 | 78·7 | 91·7 | 78·9 | S S E | ...... | Do. |
| 17 | ·878 | 84·7 | 78·2 | 92·0 | 78·3 | S by E | ...... | Do. |
| 18 | ·879 | 83·8 | 77·2 | 91·7 | 75·2 | S E by S | ...... | Do. |
| 19 | ·901 | 83·5 | 76·7 | 90·7 | 75·6 | S E by S | ...... | Do. |
| 20 | ·903 | 83·8 | 76·5 | 93·0 | 75·4 | S | ...... | Do. |
| 21 | .... | .... | .... | 93·2 | 79·1 | | | |
| 22 | ·82[illegible] | 86·0 | 78·3 | 94·3 | 79·3 | S | ...... | Do. |
| 23 | ·800 | 86·1 | 79·1 | 92·8 | 80·0 | S by E | ...... | Do. |
| 24 | ·835 | 85·6 | 79·3 | 92·1 | 78·5 | S S E | ...... | Do. |
| 25 | ·849 | 84·9 | 78·8 | 92·4 | 77·2 | S | ...... | Do. |
| 26 | ·847 | 84·5 | 77·9 | 92·8 | 75·9 | S | ...... | Do. |
| 27 | ·839 | 84·9 | 78·1 | 92·5 | 76·9 | S | ...... | Do. |
| 28 | . | .... | .... | 94·1 | 79·4 | | | |
| 29 | ·812 | 85·7 | 78·8 | 95·1 | 78·0 | S | ...... | Do. |
| 30 | ·794 | 86·1 | 78·9 | 96·4 | 78·9 | S | ...... | Do. |
| 31 | | | | | | | | |
| Means | 29·824 | 85·4 | 78·7 | 93·7 | 78·4 | | Sum. | |

**MAY 1860.**

| Date. | Barometer reduced to 32° Faht. | Thermometers. Means. Dry. | Thermometers. Means. Wet | Thermometers. Maxi. | Thermometers. Mini. | Wind. | Rain. | REMARKS. |
|---|---|---|---|---|---|---|---|---|
| | Inches | ° | ° | ° | ° | | Inches | |
| 1 | 29·749 | 87·2 | 79·1 | 100·3 | 80·7 | S by W | ...... | Clear. |
| 2 | ·704 | 87·3 | 80·0 | 93·9 | 81·5 | S | ...... | Do. |
| 3 | ·740 | 87·9 | 81·2 | 97·6 | 83·1 | S by E | ...... | Do. |
| 4 | ·767 | 87·3 | 81·0 | 93·4 | 82·4 | S | ...... | Hazy. |
| 5 | .... | .... | .... | 93·6 | 81·7 | | | |
| 6 | ·801 | 87·2 | 80·7 | 93·5 | 81·9 | S | ...... | Do. |
| 7 | ·817 | 88·0 | 80·7 | 95·2 | 82·2 | S | ...... | Clear. |
| 8 | ·775 | 89·4 | 80·9 | 100·6 | 83·2 | S S E | ...... | Do. |
| 9 | ·742 | 90·6 | 80·1 | 98·9 | 83·9 | S | ...... | Do. |
| 10 | ·713 | 92·1 | 80·4 | 105·2 | 85·1 | ? | ...... | Hazy. |
| 11 | ·694 | 91·1 | 78·7 | 100·9 | 83·5 | ? | ...... | Do. |
| 12 | .... | .... | .... | 98·6 | 82·6 | | | |
| 13 | ·688 | 90·9 | 80·8 | 102·0 | 83·9 | S by W | ...... | Do. |
| 14 | ·743 | 91·0 | 78·0 | 101·5 | 84·0 | S S W | ...... | Clear. |
| 15 | ·740 | 91·2 | 79·5 | 104·2 | 84·2 | S W | ...... | Do. |
| 16 | ·707 | 92·0 | 79·5 | 102·2 | 83·0 | ? | ...... | Hazy. |
| 17 | ·711 | 90·8 | 78·9 | 99·2 | 81·1 | S E | ...... | Clear. |
| 18 | ·732 | 89·8 | 79·9 | 97·6 | 81·5 | S E | ...... | Do. |
| 19 | .... | .... | .... | 97·9 | 82·2 | | | |
| 20 | ·736 | 89·9 | 81·0 | 100·8 | 82·9 | ? | ...... | Hazy. |
| 21 | ·681 | 89·7 | 81·7 | 96·8 | 83·1 | S S E | ...... | Do. |
| 22 | ·657 | 90·7 | 79·4 | 103·7 | 83·9 | S | ...... | Cloudy. |
| 23 | ·663 | 90·1 | 78·2 | 104·8 | 82·1 | S W | ...... | Do |
| 24 | ·653 | 91·6 | 76·1 | 105·3 | 82·4 | W S W | ...... | Hazy. |
| 25 | ·599 | 94·8 | 77·7 | 106·0 | 86·9 | W S W | ...... | Do. |
| 26 | .... | .... | .... | 105·9 | 85·7 | | | |
| 27 | ·602 | 93·7 | 80·1 | 103·8 | 85·4 | S | ...... | Clear. |
| 28 | ·643 | 92·9 | 80·6 | 102·7 | 85·6 | S | ...... | Hazy. |
| 29 | ·653 | 91·7 | 81·5 | 104·8 | 84·4 | S by W | ...... | Clear. |
| 30 | ·673 | 91·9 | 79·1 | 104·7 | 84·4 | W S W | ...... | Hazy. |
| 31 | ·709 | 90·7 | 79·6 | 101·6 | 83·9 | S W | ...... | Do. |
| Means | 29·773 | 90·4 | 79·8 | 100·6 | 83·3 | | Sum. | |

? This mark signifies that no means can be taken wing to the variable state of the Wind.

*Extract from Meteorological Observations kept at Madras Observatory, Daily Means.*

JUNE 1860.

| Date. | Barometer reduced to 32° Faht. | Thermometers. Means. Dry | Thermometers. Means. Wet | Maxi. | Mini. | Wind. | Rain. | REMARKS. |
|---|---|---|---|---|---|---|---|---|
| | Inches | ° | ° | ° | ° | | Inches | |
| 1 | 29·704 | 91·0 | 81·3 | 103·5 | 84·1 | s | ...... | Hazy. |
| 2 | .. | ... | ... | 101·1 | 86·2 | | | |
| 3 | ·654 | 92·1 | 80·0 | 103·0 | 85·5 | ? | ...... | Cloudy. |
| 4 | ·645 | 89·9 | 78·3 | 95·8 | 83·9 | ? | ...... | Overcast. |
| 5 | ·640 | 89·0 | 80·7 | 97·4 | 84·0 | s | ...... | Do. |
| 6 | ·666 | 87·8 | 76·9 | 98·6 | 82·1 | ? | ...... | Do. |
| 7 | ·642 | 88·6 | 79·2 | 100·5 | 82·2 | s s e | ...... | Do. |
| 8 | ·594 | 88·0 | 79·8 | 98·8 | 79·9 | w s w | 0·548 | Cloudy. |
| 9 | .... | ... | .... | 98·1 | 81·2 | | ·078 | |
| 10 | ·623 | 88·5 | 78·3 | 100·0 | 83·0 | s w | ...... | Overcast. |
| 11 | ·656 | 89·2 | 78·3 | 98·5 | 83·1 | s | ...... | Cloudy. |
| 12 | ·683 | 88·6 | 78·6 | 101·5 | 82·3 | s | ..... | Hazy. |
| 13 | ·702 | 90·3 | 79·3 | 103·1 | 82·1 | s s w | ..... | Do. |
| 14 | ·722 | 92·3 | 76·7 | 103·2 | 84·1 | w s w | ...... | Cloudy. |
| 15 | ·681 | 93·6 | 75·3 | 102·7 | 84·3 | w | ...... | Do. |
| 16 | .... | .... | | 102·4 | 84·1 | | | |
| 17 | ·663 | 90·4 | 77·6 | 97·5 | 80·3 | s w | ·820 | Hazy. |
| 18 | ·662 | 88·0 | 79·1 | 99·6 | 81·4 | ? | ...... | Cloudy. |
| 19 | ·671 | 87·5 | 78·7 | 95·5 | 82·5 | ? | ·093 | Do. |
| 20 | ·695 | 82·7 | 77·9 | 93·7 | 77·1 | s s w | ·034 | Overcast. |
| 21 | ·685 | 84·7 | 78·6 | 95·1 | 79·9 | s s w | ...... | Do. |
| 22 | ·715 | 86·5 | 79·7 | 95·6 | 80·4 | s | ...... | Hazy. |
| 23 | .... | .... | .... | 97·2 | 82·3 | | | |
| 24 | ·751 | 89·3 | 79·6 | 103·0 | 82·6 | s | ...... | Do. |
| 25 | ·725 | 89·5 | 77·6 | 100·7 | 83·1 | s w | .. . . | Cloudy. |
| 26 | ·715 | 89·9 | 77·2 | 101·6 | 84·3 | ? | ..... | Do. |
| 27 | ·732 | 90·0 | 77·1 | 98·4 | 84·3 | s w | ..... | Do. |
| 28 | ·717 | 88·8 | 77·5 | 97·6 | 83·9 | ? | ...... | Do. |
| 29 | ·708 | 87·1 | 76·5 | 97·8 | 80·6 | s w | ·169 | Overcast. |
| 30 | | | | 101·7 | 81·6 | | | |
| 31 | | | | | | | | |
| Means | 29.682 | 88·9 | 78·4 | 99·4 | 82·5 | | 1·742 Sum. | |

JULY 1860.

| Date. | Barometer reduced to 32° Faht. | Thermometers. Means. Dry. | Thermometers. Means. Wet | Maxi. | Mini. | Wind. | Rain. | REMARKS. |
|---|---|---|---|---|---|---|---|---|
| | Inches | ° | ° | ° | ° | | Inches | |
| 1 | 29·657 | 88·5 | 77·1 | 101·2 | 83·0 | w s w | ...... | Overcast. |
| 2 | ·623 | 90·4 | 77·6 | 98·9 | 84·3 | s w | 0·012 | Do. |
| 3 | ·647 | 88·0 | 77·7 | 97·6 | 82·8 | w | ·006 | Do. |
| 4 | ·680 | 87·3 | 78·0 | 100·8 | 81·5 | w s w | ·092 | Do. |
| 5 | ·723 | 91·1 | 77·5 | 101·6 | 83·3 | s s w | ...... | Cloudy. |
| 6 | ·749 | 89·6 | 77·7 | 103·1 | 83·8 | s w | ...... | Do. |
| 7 | .... | .... | .... | 102·9 | 84·8 | | ·006 | |
| 8 | ·769 | 88·7 | 77·4 | 99·3 | 81·1 | w s w | ·009 | Hazy. |
| 9 | ·787 | 86·3 | 77·5 | 97·9 | 78·3 | s w | ·024 | Overcast. |
| 10 | ·730 | 87·7 | 76·8 | 98·6 | 81·2 | s w | ...... | Cloudy. |
| 11 | ·686 | 86·9 | 76·0 | 96·6 | 82·1 | w s w | ...... | Overcast. |
| 12 | ·668 | 84·6 | 76·4 | 93·7 | 76·9 | w b w | ·136 | Do. |
| 13 | ·663 | 85·8 | 77·1 | 95·1 | 79·3 | w s w | ·030 | Do. |
| 14 | .... | .... | .... | 99·0 | 77·0 | | ·012 | |
| 15 | ·661 | 85·5 | 76·2 | 95·5 | 81·0 | ? | ·016 | Do. |
| 16 | ·672 | 88·9 | 76·4 | 94·7 | 85·2 | w | ·005 | Do. |
| 17 | ·703 | 88·3 | 78·7 | 100·5 | 82·8 | w s w | ·040 | Cloudy. |
| 18 | ·729 | 86·5 | 78·7 | 94·6 | 78·5 | ? | ·025 | Overcast. |
| 19 | ·730 | 85·9 | 78·1 | 97·1 | 74·9 | w n w | ·141 | Cloudy. |
| 20 | ·725 | 84·9 | 78·1 | 95·9 | 76·5 | s | ·072 | Overcast. |
| 21 | ... | .. | ... | 96·2 | 76·2 | | ·615 | |
| 22 | ·713 | 86·0 | 78·2 | 97·4 | 78·5 | s w | ...... | Cloudy. |
| 23 | ·746 | 85·7 | 78·0 | 95·2 | 78·9 | s w | ...... | Hazy. |
| 24 | ·736 | 84·7 | 77·3 | 97·6 | 78·1 | s s w | ·020 | Overcast. |
| 25 | ·703 | 87·7 | 78·1 | 99·6 | 80·6 | s b w | ...... | Cloudy. |
| 26 | ·725 | 85·8 | 77·7 | 93·6 | 78·9 | s b w | ·678 | Overcast. |
| 27 | ·741 | 86·0 | 75·8 | 94·5 | 79·2 | s w | ...... | Cloudy. |
| 28 | .... | .... | .... | 94·5 | 82·0 | | ...... | |
| 29 | ·730 | 87·8 | 75·9 | 98·6 | 81·4 | w s w | ...... | Do. |
| 30 | ·715 | 86·3 | 76·4 | 94·5 | 80·5 | s s w | ...... | Overcast. |
| 31 | ·744 | 87·2 | 77·3 | 99·1 | 81·0 | s b w | ·132 | Do. |
| Means | 29·709 | 87·1 | 77·3 | 97·6 | 80·4 | | 2·071 Sum. | |

## *Extract from Meteorological Observations kept at Madras Observatory, Daily Means.*

### AUGUST 1860.

| Date. | Barometer reduced to 32° Faht. | Thermometers. Means. Dry. | Thermometers. Means. Wet | Thermometers. Maxi. | Thermometers. Mini. | Wind. | Rain. | REMARKS. |
|---|---|---|---|---|---|---|---|---|
| | Inches | ° | ° | ° | ° | | Inches | |
| 1 | 29·750 | 86·8 | 77·7 | 95·0 | 80·5 | S W | ...... | Overcast. |
| 2 | ·719 | 88·6 | 75·6 | 97·7 | 82·8 | S W | ..... | Do. |
| 3 | ·716 | 89·6 | 74·9 | 98·8 | 82·5 | W S W | ...... | Cloudy. |
| 4 | .... | .... | .... | 98·7 | 81·5 | | ..... | |
| 5 | ·704 | 88·6 | 76·8 | 98·4 | 80·4 | S W | 0·045 | Do. |
| 6 | ·688 | 85·8 | 76·8 | 97·8 | 80·4 | W S W | ·700 | Overcast. |
| 7 | ·699 | 87·3 | 77·1 | 98·6 | 81·1 | S W | ·010 | Do. |
| 8 | ·756 | 87·1 | 76·9 | 100·8 | 79·1 | S W | ..... | Clear. |
| 9 | ·792 | 87·8 | 77·9 | 95·2 | 80·8 | S S W | ...... | Hazy. |
| 10 | ·766 | 86·1 | 77·7 | 95·0 | 79·0 | ? | ·041 | Cloudy. |
| 11 | .... | .... | .... | 96·3 | 78·1 | | ·299 | |
| 12 | ·725 | 85·2 | 76·8 | 94·2 | 79·0 | S W | ·025 | Overcast. |
| 13 | ·742 | 85·6 | 76·8 | 97·6 | 78·1 | W B N | ...... | Do. |
| 14 | ·759 | 86·2 | 76·8 | 97·5 | 79·2 | ? | ..... | Cloudy. |
| 15 | ·761 | 85·0 | 78·0 | 91·0 | 78·3 | ? | ·007 | Do. |
| 16 | ·748 | 82·0 | 77·5 | 94·6 | 77·1 | S S W | ·144 | Overcast. |
| 17 | ·739 | 82·0 | 77·5 | 99·5 | 75·0 | S S W | ·139 | Do. |
| 18 | .... | .... | .... | 91·5 | 77·2 | | ...... | |
| 19 | ·814 | 85·0 | 79·1 | 92·8 | 78·6 | S S E | ...... | Hazy. |
| 20 | ·814 | 85·4 | 79·3 | 93·4 | 79·3 | S B E | ...... | Do. |
| 21 | ·783 | 85·9 | 79·0 | 93·8 | 80·5 | S B E | ...... | Cloudy. |
| 22 | ·783 | 85·3 | 79·1 | 92·5 | 79·9 | S | ...... | Hazy. |
| 23 | ·791 | 86·7 | 79·2 | 94·5 | 80·0 | S E | ...... | Do. |
| 24 | ·802 | 86·5 | 79·0 | 94·4 | 80·6 | S | ...... | Do. |
| 25 | .... | .... | .... | 95·0 | 79·0 | | ..... | |
| 26 | ·835 | 84·2 | 79·3 | 99·2 | 81·7 | S S E | ·205 | Cloudy. |
| 27 | ·833 | 83·8 | 78·7 | 94·7 | 78·3 | ? | ·626 | Hazy. |
| 28 | ·796 | 84·6 | 77·8 | 95·7 | 77·1 | S W | ...... | Cloudy. |
| 29 | ·751 | 83·7 | 77·7 | 93·0 | 77·6 | S W | ...... | Overcast. |
| 30 | ·753 | 83·3 | 77·9 | 90·5 | 77·1 | S W | ·795 | Do. |
| 1 | ·754 | 83·2 | 77·9 | 92·3 | 76·0 | S W | ·033 | Do. |
| Means | 29·762 | 85·6 | 77·7 | 94·5 | 79.2 | | 2·469 | |
| | | | | | | | Sum. | |

### SEPTEMBER 1860.

| Date. | Barometer reduced to 32° Faht. | Thermometers. Means. Dry. | Thermometers. Means. Wet | Thermometers. Maxi. | Thermometers. Mini. | Wind. | Rain. | REMARKS. |
|---|---|---|---|---|---|---|---|---|
| | Inches | ° | ° | ° | ° | | Inches | |
| 1 | | | | 92·1 | 77·0 | | 0·340 | |
| 2 | 29·701 | 83·3 | 77·5 | 89·5 | 80·1 | W N W | ...... | Overcast. |
| 3 | ·697 | 84·1 | 76·6 | 92·3 | 78·8 | W S W | ·040 | Do. |
| 4 | ·701 | 84·4 | 77·0 | 94·7 | 78·0 | S W | ·105 | Cloudy. |
| 5 | ·745 | 84·5 | 77·5 | 92·2 | 79·4 | ? | ..... | Overcast. |
| 6 | ·785 | 84·7 | 78·4 | 91·6 | 79·2 | S S W | ·016 | Cloudy. |
| 7 | ·769 | 84·2 | 78·9 | 90·2 | 80·6 | S | ·038 | Overcast. |
| 8 | .... | .... | .... | 93·1 | 77·2 | | ·042 | |
| 9 | ·790 | 84·6 | 78·5 | 93·4 | 78·5 | S W | ...... | Do. |
| 10 | ·808 | 85·3 | 78·5 | 95·2 | 77·6 | ? | ...... | Do. |
| 11 | ·766 | 86·1 | 79·0 | 95·5 | 80·0 | ? | ...... | Hazy. |
| 12 | ·744 | 84·3 | 77·5 | 94·3 | 78·7 | S S W | ·998 | Overcast. |
| 13 | ·757 | 81·1 | 76·0 | 93·5 | 74·7 | W S W | ·208 | Do. |
| 14 | ·755 | 84·5 | 77·0 | 94·8 | 78·3 | S S W | ..... | Hazy. |
| 15 | .... | .... | .... | 91·9 | 79·5 | | ...... | |
| 16 | ·720 | 83·0 | 77·6 | 89·4 | 77·4 | S W | ·288 | Overcast. |
| 17 | ·721 | 82·5 | 76·9 | 90·3 | 76·7 | W S W | ·700 | Do. |
| 18 | ·747 | 82·9 | 77·2 | 90·6 | 77·0 | S W | ·359 | Do. |
| 19 | ·765 | 83·5 | 77·3 | 92·7 | 77·3 | S W | ·012 | Hazy. |
| 20 | ·779 | 84·5 | 78·0 | 93·0 | 77·9 | ? | ...... | Do. |
| 21 | ·787 | 84·4 | 76·9 | 94·0 | 77·1 | S W | ...... | Do. |
| 22 | .... | ... | .... | 93·3 | 80·4 | | ...... | |
| 23 | ·764 | 84·2 | 77·8 | 90·9 | 78·0 | N W | ..... | Cloudy. |
| 24 | ·750 | 83·7 | 79·6 | 89·2 | 79·5 | ? | ...... | Overcast. |
| 25 | ·726 | 80·8 | 77·6 | 84·8 | 75·0 | ? | ·434 | Do. |
| 26 | ·791 | 81·2 | 77·1 | 90·5 | 75·8 | W N W | ·064 | Do. |
| 27 | ·701 | 82·0 | 78·1 | 91·1 | 76·8 | S | ·485 | Do. |
| 28 | ·731 | 83·8 | 78·1 | 92·4 | 77·9 | S S W | ..... | Hazy. |
| 29 | .... | .... | .... | 93·2 | 79·3 | | ...... | |
| 30 | ·757 | 84·3 | 79·3 | 95·5 | 79·2 | S W | ·842 | Do. |
| 1 | | | | | | | | |
| Means | 29·746 | 83·7 | 77·8 | 92·3 | 78·1 | | 4·971 | |
| | | | | | | | Sum. | |

| Date. | October 1860. Barometer reduced to 32° Faht. | Thermometers. Means. Dry. | Means. Wet | Maxi. | Mini. | Wind. | Rain. | REMARKS. | November 1860. Barometer reduced to 32° Faht. | Thermometers. Means. Dry. | Means. Wet | Maxi. | Mini. | Wind. | Rain. | REMARKS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Inches | ° | ° | ° | ° | | Inches | | Inches | ° | ° | ° | ° | | Inches | |
| 1 | 29.785 | 84·2 | 79·6 | 91·8 | 77·9 | W S W | ....... | Cloudy. | 29·862 | 76·3 | 67·5 | 85·4 | 68 4 | N N E | ...... | Clear. |
| 2 | ·813 | 84 6 | 80·3 | 91·3 | 80 0 | W S W | ...... | Do. | ·867 | 77·4 | 70·9 | 84·5 | 71·1 | E by N | .. ... | Do. |
| 3 | ·845 | 84·2 | 79 6 | 90·4 | 77·7 | ? | ...... | Hazy. | .... | | .... | 85·3 | 70·0 | N by E | ...... | |
| 4 | ·869 | 84·0 | 79 3 | 89·4 | 78·1 | S by W | ...... | Do. | ·899 | 77·3 | 70·2 | 84·3 | 70 6 | N by W | ...... | Hazy. |
| 5 | ·891 | 83·7 | 78·3 | 90·5 | 78·1 | S S W | ...... | Do. | ·908 | 77 8 | 70·9 | 83 1 | 72·4 | N N E | ...... | Cloudy. |
| 6 | .... | | .... | 88·7 | 79·1 | S by W | ...... | | ·904 | 77·0 | 68·3 | 84·4 | 71·5 | N by E | ... .. | Do. |
| 7 | ·911 | 83 3 | 78·3 | 91·4 | 78·2 | S S W | 0·050 | Cloudy. | ·921 | 76·5 | 67·5 | 84 0 | 69 7 | N | ..... | Hazy. |
| 8 | ·801 | 81·6 | 77·2 | 89·0 | 76 2 | ? | ...... | Do. | .941 | 76·3 | 68·4 | 86·0 | 68·1 | N | ...... | Clear. |
| 9 | ·833 | 81·8 | 76 6 | 88·5 | 75·1 | E S E | ...... | Clear. | ·958 | 76·5 | 68·6 | 85·7 | 66 6 | N | ...... | Do. |
| 10 | ·821 | 83·0 | 77 5 | 88 6 | 77 2 | S E | ·087 | Hazy. | .... | | .... | 82·5 | 70·4 | ? | ...... | |
| 11 | ·858 | 80·8 | 76·6 | 86·0 | 75·3 | ? | ·714 | Cloudy. | ·965 | 78·8 | 71·9 | 84 9 | 71·7 | E N E | ...... | Do. |
| 12 | ·869 | 82·2 | 77·4 | 87·3 | 77·5 | S S E | ·280 | Do. | ·951 | 78·6 | 71·9 | 84·7 | 72·7 | N by W | ...... | Do. |
| 13 | .. | .... | | 87 0 | 77·3 | E S E | .. ... | | ·936 | 79·3 | 74·7 | 84·6 | 75·4 | N | 0·863 | Overcast. |
| 14 | ·848 | 81.6 | 78·0 | 86 7 | 76·7 | S E | 1·119 | Do. | ·890 | 77 6 | 71·1 | 82·2 | 73·8 | N N E | ...... | Do. |
| 15 | 830 | 81 3 | 78·1 | 86·5 | 77·0 | S S E | 0.461 | Do. | ·853 | 74 1 | 66·2 | 82.8 | 66·9 | N by W | ...... | Cloudy. |
| 16 | ·836 | 81·4 | 78·3 | 86·6 | 77 1 | S E | ·132 | Do. | .866 | 73 0 | 65·1 | 84·8 | 63·5 | N N W | ...... | Do. |
| 17 | ·844 | 80·3 | 77·4 | 87·8 | 76·1 | ? | ·468 | Overcast. | .... | .. .. | .... | 86 8 | 66·2 | W by N | ...... | |
| 18 | ·872 | 79·5 | 76·7 | 84·3 | 74·1 | S S E | 1·926 | Do. | ·846 | 75·7 | 69 5 | 87·0 | 69·1 | ? | .... | Clear. |
| 19 | ·853 | 77·5 | 75·7 | 79·3 | 75·3 | N | 1·341 | Do. | ·890 | 78·2 | 72·7 | 86·8 | 71·1 | E N E | .. ... | Do. |
| 20 | .... | .... | .... | 75 7 | 73·5 | N N E | 3·135 | | ·934 | 78 1 | 73·6 | 84 9 | 72·4 | E S E | ...... | Do. |
| 21 | ·791 | 75·1 | 74·2 | 76 8 | 73.3 | ? | 3·758 | Do. | ·938 | 79·0 | 74·2 | 86·2 | 72·7 | E N E | ..... | Hazy. |
| 22 | ·798 | 75·2 | 73·7 | 83·2 | 71 4 | E N E | 0·285 | Do. | ·957 | 78·5 | 74·8 | 83 9 | 74 0 | ? | ·331 | Cloudy. |
| 23 | ·816 | 79·6 | 77.2 | 84·7 | 76.0 | E N E | ·280 | Do. | ·996 | 78·3 | 74·0 | 84·0 | 73·0 | E | ...... | Hazy. |
| 24 | ·845 | 80 5 | 77·3 | 86·6 | 76.4 | N E | ·030 | Cloudy. | .... | .... | ... | 83·9 | 73 4 | E | ...... | |
| 25 | ·843 | 81·0 | 77 5 | 87·1 | 77.1 | E | ...... | Hazy. | 30 012 | 77·8 | 72 6 | 82·7 | 71·7 | E by S | ...... | Do. |
| 26 | ·826 | 80 9 | 77·1 | 86 8 | 75·8 | ? | . .... | Cloudy. | ·030 | 78·3 | 70·6 | 82·5 | 73·3 | E S E | ...... | Do. |
| 27 | .... | ... | ... | 86·5 | 74 0 | E N E | ...... | | ·027 | 79·6 | 71·6 | 83·5 | 77·0 | E N E | ...... | Do |
| 28 | ·825 | 80·3 | 75·9 | 88·3 | 73·0 | S S E | ...... | Do. | ·019 | 78·3 | 71·4 | 82·5 | 71·7 | E N E | ...... | Cloudy. |
| 29 | ·843 | 81·5 | 77 3 | 89·1 | 76·5 | S W | ...... | Do. | 29·980 | 77·3 | 73·2 | 80 5 | 73·6 | E | ·756 | Overcast. |
| 30 | ·862 | 80 8 | 76·3 | 87·9 | 75·1 | S S E | ...... | Hazy. | ·962 | 76 9 | 73·7 | 82 6 | 74·1 | N by E | ·130 | Do. |
| 1 | ·868 | 78 1 | 71·5 | 86·2 | 71·4 | ? | ...... | Clear. | | | | | | | | |
| Means | 29 844 | 81·0 | 77·1 | 86·8 | 76·0 | | 14·066 Sum. | | 29·935 | 77·4 | 71·0 | 84·2 | 71·2 | | 2·080 Sum. | |

? This mark signifies that no means can be taken owing to the variable state of the Wind.

*Extract from Meteorological Observations kept at Madras Observatory, Daily Means.*

DECEMBER 1860.

| Date. | Barometer reduced to 32° Faht. | Thermometers. Means. Dry. | Wet. | Maxi. | Mini. | Wind. | Rain. | REMARKS. |
|---|---|---|---|---|---|---|---|---|
| | Inches | ° | ° | ° | ° | | Inches | |
| 1 | .... | .... | .... | 80·7 | 70·6 | N | ...... | |
| 2 | 29·942 | 75 8 | 70·3 | 81·7 | 69 6 | N E | ...... | Cloudy. |
| 3 | ·932 | 77·1 | 70 4 | 81·8 | 71·2 | N E | ...... | Do. |
| 4 | ·939 | 76.9 | 70·2 | 82·0 | 71·4 | N | ...... | Do. |
| 5 | ·919 | 75·4 | 69 9 | 81 3 | 69·5 | N N E | 0·098 | Do. |
| 6 | ·873 | 77 8 | 73·8 | 81·7 | 73 7 | E N E | ·037 | Overcast. |
| 7 | ·882 | 78 8 | 73·8 | 82·5 | 74·2 | N E | ·036 | Do. |
| 8 | .... | .... | .... | 82 7 | 75·1 | N N E | ·025 | |
| 9 | ·950 | 78 6 | 72·6 | 81 5 | 75 9 | E | ...... | Cloudy. |
| 10 | ·984 | 77·5 | 70·1 | 82·0 | 71·6 | N E | ...... | Hazy. |
| 11 | ·980 | 75·4 | 69 2 | 81·4 | 69·2 | E by N | ...... | Do. |
| 12 | ·944 | 76·3 | 69·1 | 81·8 | 70·4 | N N E | ...... | Do. |
| 13 | ·943 | 75 9 | 69·6 | 81·4 | 70·0 | N E | ...... | Do. |
| 14 | .961 | 75 7 | 70·5 | 80 8 | 70·5 | N N E | ...... | Cloudy. |
| 15 | .... | ... | .... | 81 8 | 72·2 | E N E | ...... | |
| 16 | ·987 | 77·5 | 69·5 | 80·7 | 75·1 | N E | ...... | Do. |
| 17 | ·962 | 76·8 | 69·2 | 81·3 | 70·2 | N E | ...... | Do. |
| 18 | ·964 | 77·8 | 70·4 | 81·0 | 75 4 | E N E | ...... | Overcast. |
| 19 | 996 | 77·6 | 70·6 | 82·0 | 73·1 | E N E? | ...... | Cloudy. |
| 20 | 30 021 | 75·7 | 70·7 | 81·2 | 70·1 | N E | ..... | Hazy. |
| 21 | ·035 | 75 8 | 70·2 | 81 4 | 69 5 | E N E | ...... | Do. |
| 22 | .... | .... | .... | 79·2 | 68·6 | E N E | ...... | |
| 23 | .023 | 75·4 | 69 7 | 80·7 | 69·2 | E | ...... | Cloudy. |
| 24 | ·027 | 74·6 | 70·3 | 80·8 | 69·3 | ?E N E? | ..... | Do. |
| 25 | ·018 | 76·0 | 71·7 | 80 7 | 71·9 | E | ·032 | Do. |
| 26 | 019 | 74 8 | 68·4 | 80·2 | 68·3 | E | ...... | Hazy. |
| 27 | ·005 | 74 8 | 68·5 | 80 9 | 68 1 | E N E | ...... | Do. |
| 28 | ·019 | 76·5 | 69·7 | 81·0 | 70·2 | N E | ...... | Do. |
| 29 | .... | ... | .... | 79·4 | 70 2 | N N E | ...... | |
| 30 | ·063 | 77·0 | 70·2 | 80·6 | 75·0 | E | ....... | Do. |
| 31 | ·071 | 75·3 | 68·8 | 79·7 | 69·1 | E | ...... | Do. |
| Means | 29 979 | 76·4 | 70 3 | 81·2 | 71·2 | | 0·228 Sum. | |

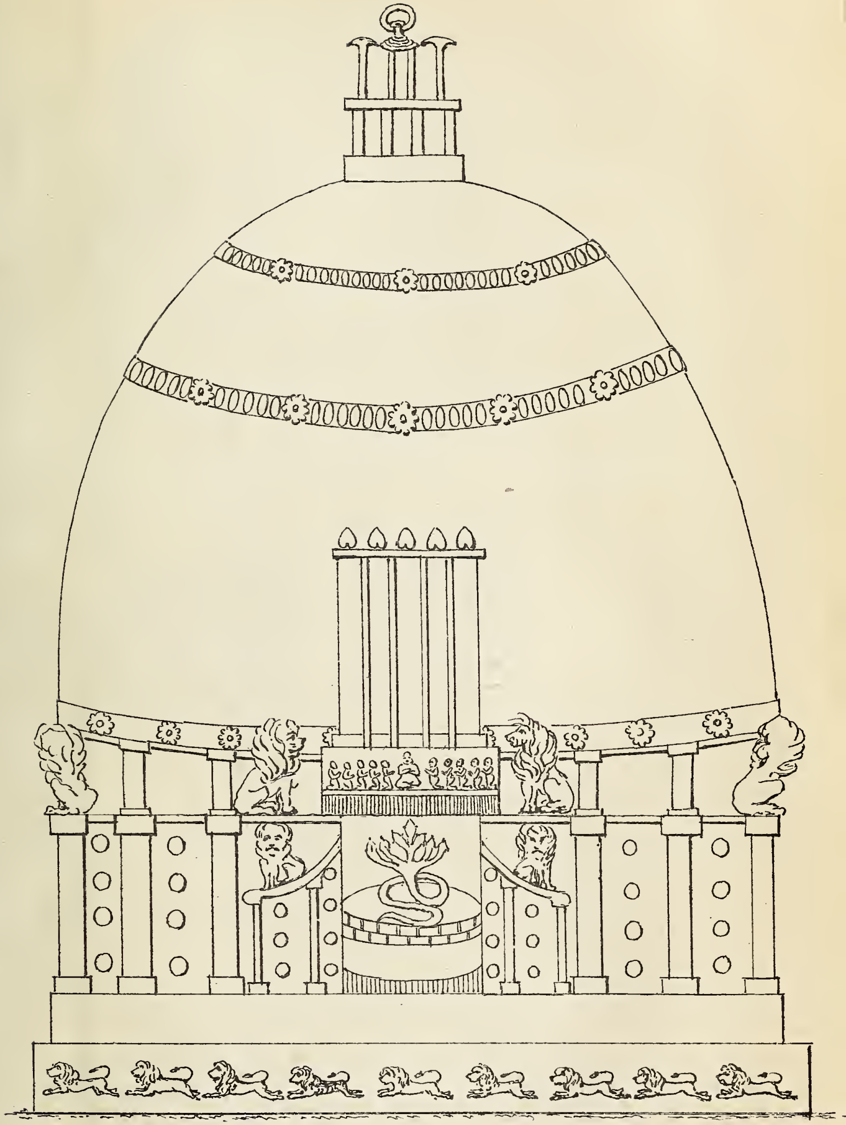
? This mark signifies that no means can be taken owing to the variable state of the Wind.

*Extract from Meteorological Observations kept at Madras Observatory.*

## HOURLY MEANS.

| Gottingen Mean Time | Noon | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Madras Mean Time | P. M. h m 4 41 | h m 5 41 | h m 6 41 | h m 7 41 | h m 8 41 | h m 9 41 | h m 10 41 | h m 11 41 | h m 12 41 | h m 13 41 | h m 14 41 | h m 15 41 |
| **Bar. at 32° Faht.** 1860 | In. | In. | In. | In. | In. | In. | In. | In. | In. | In. | In. | In. |
| April | 29·756 | 29·772 | 29·792 | 29·815 | 29·835 | 29·854 | 29·856 | 29·845 | 29·829 | 29·814 | 29.805 | 29·806 |
| May | ·640 | ·653 | ·675 | ·698 | ·719 | ·733 | ·738 | ·729 | ·717 | ·702 | ·693 | ·694 |
| June | ·616 | ·625 | ·647 | 671 | ·691 | ·704 | ·712 | ·703 | ·691 | ·679 | ·670 | ·671 |
| July | 29·634 | 29·643 | 29·665 | 29·689 | 29·715 | 29·734 | 29·742 | 29·736 | 29·724 | 29·713 | 29·702 | 29·699 |
| August | ·689 | ·700 | ·720 | ·747 | ·771 | ·789 | ·796 | ·786 | ·774 | ·763 | 755 | ·754 |
| Sep. | ·678 | ·694 | ·717 | ·742 | ·767 | ·780 | ·780 | ·769 | 755 | ·740 | ·729 | ·729 |
| October | 29·782 | 29·798 | 29·822 | 29·849 | 29·868 | 29·879 | 29·874 | 29·864 | 29·846 | 29·831 | 29·823 | 29·821 |
| Nov. | 883 | ·900 | 923 | ·947 | ·963 | ·971 | ·963 | ·953 | ·938 | ·922 | ·911 | ·910 |
| Dec. | 934 | ·948 | ·968 | ·992 | 69·007 | 30·011 | 30·006 | ·994 | ·980 | ·964 | ·951 | ·946 |
| **Dry Thermometer.** | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° |
| April | 88·8 | 86·5 | 84·6 | 83·7 | 83·2 | 82·7 | 82·3 | 81·7 | 81·0 | 80·2 | 79·5 | 79·3 |
| May | 94·0 | 91·1 | 89·1 | 88·2 | 87·5 | 87·0 | 86·5 | 86·1 | 85·6 | 85·2 | 84·9 | 84·4 |
| June | 92·2 | 90·0 | 87·7 | 87·4 | 87·0 | 86·4 | 85·6 | 85·2 | 84·8 | 84·7 | 84·1 | 83·5 |
| July | 91·8 | 89·7 | 87·1 | 85·8 | 84·9 | 84·1 | 83·7 | 83·2 | 82·9 | 82·0 | 81·6 | 81·5 |
| August | 90·2 | 87·5 | 85·4 | 84·5 | 83·9 | 83·6 | 82·9 | 82·5 | 82·1 | 81·7 | 81·1 | 80·4 |
| Sep. | 87·5 | 85·0 | 83·7 | 82·8 | 8[illegible]·1 | 81·6 | 81·2 | 80·7 | 80·0 | 79·8 | 79·3 | 78·9 |
| October | 83·6 | 82·1 | 81·4 | 80·9 | 80·3 | 79·6 | 79·1 | 78·6 | 77·7 | 77·5 | 77·2 | 76·9 |
| Nov. | 80·8 | 79·0 | 77·9 | 77·0 | 76·4 | 75·6 | 74·9 | 74·4 | 74·2 | 73·4 | 72·9 | 72·6 |
| Dec. | 78·4 | 77·4 | 76·8 | 76·6 | 76·2 | 75·7 | 75·3 | 74·8 | 74·3 | 73.7 | 73·3 | 72·6 |
| **Wet Thermometer.** | | | | | | | | | | | | |
| April | 79·8 | 79·6 | 79·2 | 79·0 | 78·8 | 78·8 | 78·7 | 78·3 | 77·9 | 77·4 | 77·1 | 76·9 |
| May | 81·9 | 81·6 | 81·1 | 80·8 | 80·4 | 80·3 | 80·0 | 79·6 | 78·8 | 78·4 | 78·2 | 77·9 |
| June | 80·1 | 79·8 | 79·6 | 79·4 | 79·1 | 78·9 | 78·8 | 78·4 | 77·9 | 77·8 | 77·2 | 76.4 |
| July | 79·1 | 78·9 | 78·7 | 78·5 | 78·1 | 77·7 | 77·5 | 77·4 | 77·2 | 76·8 | 76·5 | 76·0 |
| August | 79·0 | 78·8 | 78·5 | 78·3 | 78·4 | 78·3 | 78·1 | 77·9 | 77·7 | 77·2 | 76·9 | 76·3 |
| Sep. | 79·2 | 79·1 | 78·8 | 78·4 | 78·4 | 78·4 | 78·2 | 78·1 | 77·4 | 77·2 | 76·5 | 76·3 |
| October | 78·1 | 77·7 | 77·4 | 77·4 | 77·2 | 77·1 | 76·9 | 76·6 | 76·1 | 76·0 | 75·9 | 75·7 |
| Nov. | 71·4 | 71·3 | 71·2 | 71·3 | 71·2 | 70·9 | 70·7 | 70·7 | 70·6 | 70·2 | 69·9 | 69·7 |
| Dec. | 70·9 | 70·5 | 70·3 | 70·0 | 70·2 | 70·1 | 70·0 | 69·9 | 69·9 | 69·6 | 69·4 | 69·2 |

| Gottingen Mean Time | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | Means. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Madras Mean Time | h m 16 41 | h m 17 41 | h m 18 41 | h m 19 41 | h m 20 41 | h m 21 41 | h m 22 41 | h m 23 41 | h m 0 41 | h m 1 41 | h m 2 41 | h m 3 41 | |
| **Bar. at 32° Faht.** 1860 | In. | In. | In. | In. | In. | In. | In. | In. | In. | In. | In. | In. | In. |
| April | 29.817 | 29·833 | 29·853 | 29·872 | 29·886 | 29·884 | 29·871 | 29·851 | 29·820 | 29·789 | 29·766 | 29·754 | 29·824 |
| May | ·701 | ·718 | ·737 | ·754 | ·764 | ·762 | ·747 | ·727 | ·702 | ·677 | ·653 | ·638 | ·707 |
| June | ·679 | ·693 | 712 | ·726 | 738 | .737 | ·721 | ·701 | ·676 | ·652 | 629 | ·614 | ·682 |
| July | 29·708 | 29·721 | 29·740 | 29·755 | 29·766 | 29·764 | 29·754 | 29·733 | 29·709 | 29·682 | 29·658 | 29·641 | 29·709 |
| August | ·762 | ·773 | ·789 | ·808 | ·820 | ·819 | ·805 | ·786 | ·755 | ·730 | ·708 | ·690 | ·762 |
| Sep. | ·736 | ·750 | ·771 | ·795 | ·807 | 807 | ·793 | ·768 | ·738 | 709 | ·686 | ·677 | ·746 |
| October | 29·833 | 29·850 | 29·870 | 29·891 | 29·903 | 29·904 | 29·886 | 29·859 | 29·832 | 20·806 | 29·704 | 29·781 | 29·844 |
| Nov. | ·920 | ·935 | ·952 | ·972 | ·992 | 992 | ·978 | ·949 | ·920 | ·895 | ·878 | ·878 | ·935 |
| Dec. | 954 | ·970 | ·989 | 30·015 | 30·035 | 30·037 | 30·024 | ·999 | ·973 | ·947 | ·929 | ·928 | ·979 |
| **Dry Thermometer.** | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° |
| April | 79·0 | 78·7 | 80·8 | 84·5 | 88·0 | 90·7 | 92·4 | 92·9 | 93·0 | 92·5 | 91·9 | 90·5 | 85·4 |
| May | 83·9 | 83·6 | 86·1 | 90·1 | 93·6 | 96·7 | 99·1 | 99·7 | 98·5 | 97·2 | 96·6 | 95·8 | 90·4 |
| June | 83.2 | 82·7 | 84.3 | 87.0 | 90·0 | 92·3 | 94·6 | 96·7 | 97·5 | 97·0 | 96·4 | 94·4 | 88·9 |
| July | 81·3 | 81·1 | 82·0 | 84·4 | 86·8 | 89·4 | 91·6 | 93·7 | 95·2 | 96·6 | 95·8 | 94·6 | 87·1 |
| August | 79·9 | 79·6 | 80·5 | 82·9 | 85·6 | 88·0 | 90·3 | 91·7 | 92·6 | 93·1 | 92·8 | 91·9 | 85·6 |
| Sep. | 78·5 | 78·6 | 79·4 | 81·6 | 83·7 | 85·9 | 87·9 | 89·6 | 90·7 | 91·1 | 89·9 | 88·6 | 83·7 |
| October | 76·9 | 76·6 | 77·7 | 79·8 | 82·0 | 83·6 | 85·1 | 85·9 | 86·0 | 86·2 | 85·7 | 84·6 | 81·0 |
| Nov. | 72·1 | 71·7 | 72·7 | 75·4 | 78·4 | 80·7 | 82·5 | 83·3 | 83·4 | 83·7 | 82·9 | 82·0 | 77·4 |
| Dec. | 72·4 | 72·0 | 72·1 | 74·3 | 77·2 | 79·2 | 80·3 | 80·7 | 80·7 | 80·3 | 80·1 | 79·4 | 76·4 |
| **Wet Thermometer.** | | | | | | | | | | | | | |
| April | 76·7 | 76·3 | 77·3 | 78·7 | 79·0 | 79·2 | 79·6 | 80·0 | 80·2 | 80·1 | 80·0 | 79·9 | 78·7 |
| May | 77·4 | 77·1 | 77·7 | 78.5 | 79·0 | 79·4 | 80·0 | 80·5 | 81·1 | 81·6 | 81·7 | 81·9 | 79·8 |
| June | 76·2 | 75·9 | 76·4 | 77·1 | 77·8 | 77.9 | 78·3 | 78·9 | 79·5 | 79·6 | 79·8 | 80·4 | 78·4 |
| July | 75·7 | 75·2 | 75·4 | 76·0 | 76·3 | 76·8 | 77·0 | 77·3 | 77·9 | 78·2 | 78·6 | 78·9 | 77·3 |
| August | 75·8 | 75·5 | 75·8 | 76·4 | 76·8 | 77·5 | 77·9 | 78·4 | 78·8 | 79·0 | 79·2 | 79·2 | 77·7 |
| Sep. | 75·8 | 75·6 | 75·8 | 76·6 | 77·0 | 77·5 | 77·7 | 78·3 | 78·7 | 79·1 | 79·1 | 79·2 | 77·8 |
| October | 75·6 | 75·3 | 75·8 | 76·7 | 77·5 | 77·9 | 78·3 | 78·5 | 78·4 | 78·7 | 78·6 | 78·0 | 77·1 |
| Nov. | 69·5 | 69·2 | 69·5 | 70·5 | 71·7 | 72·1 | 72·3 | 72·0 | 71·8 | 72·1 | 71·7 | 71·5 | 71·0 |
| Dec. | 68·9 | 68·7 | 68·8 | 69·8 | 71·0 | 71·4 | 72·7 | 71·6 | 71·4 | 71·1 | 71·3 | 71·1 | 70·3 |



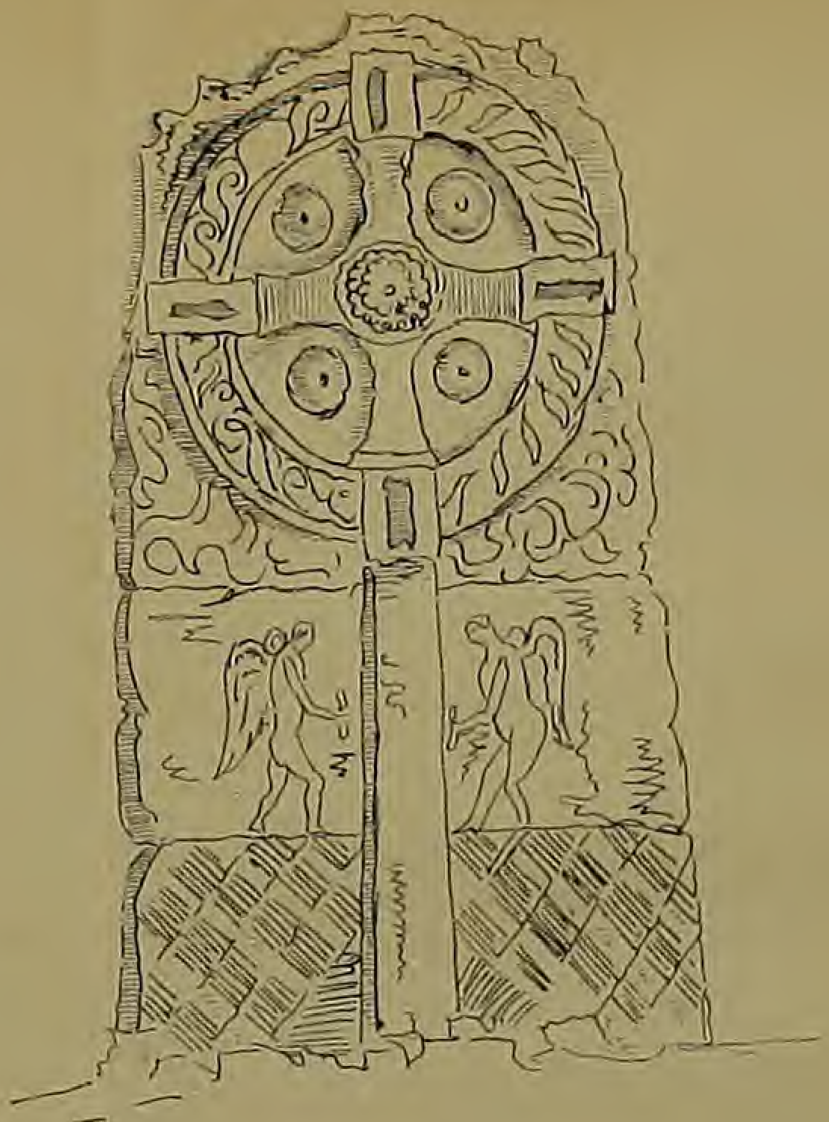
RESTORED FORM OF THE BUDDHIST DAGOBAHS.

*DEDUCED FROM THE SCULPTURES ON THE MASULIPATAM STONES.*

PHAROAH AND Cº _ MADRAS 1861.

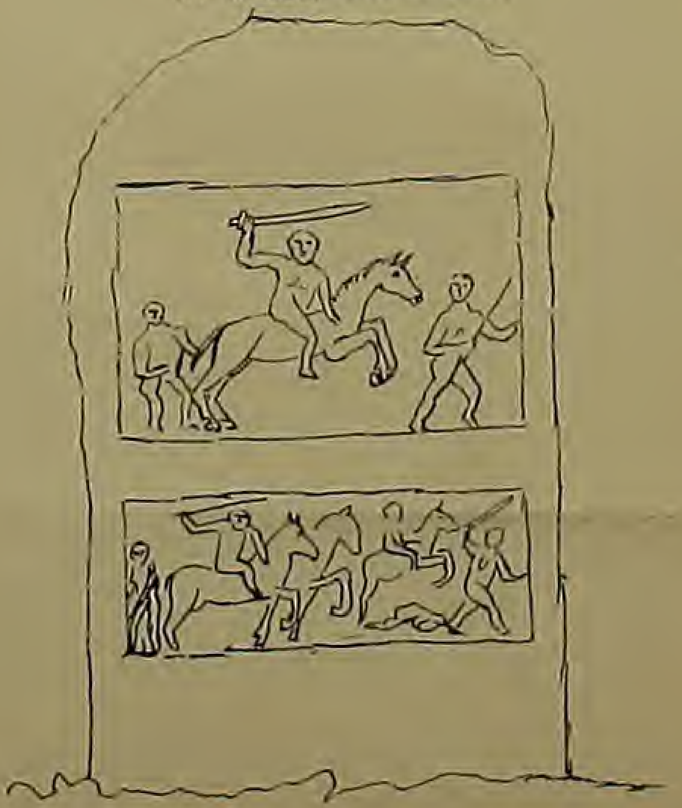
AT MASULIPATAM _ INDIA.

AT ABERLEMNO _ SCOTLAND.



AT ABERLEMNO.

AT MASULIPATAM _ INDIA.



AT ABERLEMNO _ SCOTLAND.

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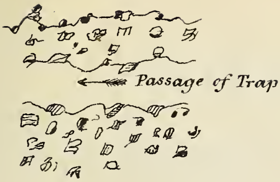
PERIOD 1ST

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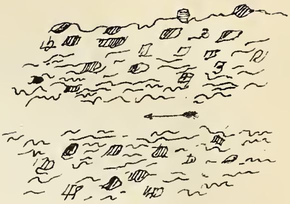

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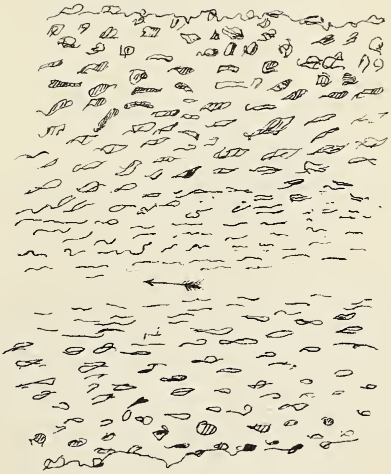

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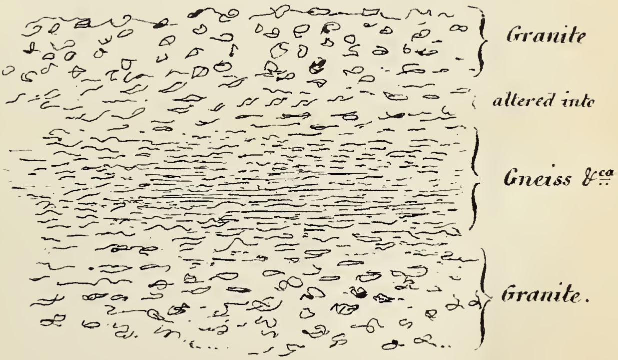


*N.B. The external pressure cannot operate to alter the shape of the crystals of the unheated Granite farthest from the Trap, and nearest the points of pressure.*

PHAROAH AND Co. _ MADRAS 1861.

BRITISH MUSEUM
NATURAL HISTORY

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## XIV—*Remarks on the Druidic Antiquities of the South of India.* By MAJOR H. CONGREVE.

### CROMLECHS.

THE Cromlech at Palicondah in the Carnatic, is remarkable for its double ring of stones. In my account of it in this Journal,* I did not place sufficient emphasis on this circumstance, which is one of the greatest evidences of the Druidic origin of this altar as will be seen from the following account of similar antiquities in Europe. At this day, in Denmark, Sweden, and Norway, in the middle of a plain, or upon some eminence, altars are found, around which the ancient inhabitants assembled to offer sacrifices and to assist at other religious ceremonies. The greatest part of these altars are raised upon a little hill, either natural or artificial. Three long pieces of rock set upright serve as a basis to a great flat stone, which forms the table of the altar. There is commonly a pretty large cavity under this altar, which might be intended to receive the blood of the victims; and stones for striking fire are scattered round it; for no other fire, but such as was struck forth with a flint, was thought pure enough for so holy a purpose. Sometimes these rural altars are constructed in a more magnificent manner; *a double range of enormous stones* surround the altar and the little hill on which it is erected. In Zealand there is one of this kind; which is formed of stones of a prodigious magnitude.

* Old Series No. XXXI. March 1846, p. 47.

Men would even now be afraid to undertake such a work, notwithstanding all the assistance of the mechanic powers which in those times they wanted. What redoubles the astonishment is, that stones of that size are rarely to be seen throughout the island, and that they must have been brought from a great distance.

In Scotland so far as can be gathered from the vestiges of such of these sacred enclosures as remain least defaced, they seem in their perfect state to have generally consisted of the circular row or double row of stones in the central open space (the proper *lucus* or place of light) and beyond these, of a wood surrounded by a ditch and a mound. A holy fountain or rivulet appears also to have usually watered the grove. Near to the temple frequently rose a sacred mount, from which it is conjectured the priests were wont to address the people.

At Trer Dryw in Anglesey are also the relics of a circle of stones, with the Cromlech in the midst ; but all extremely imperfect. Two of the stones are very large ; one, which serves at present as part of the end of a house, is twelve feet seven inches high, and eight broad ; another eleven feet high, and twenty-three feet in girth. Some lesser stones yet remain. This circle, when complete, was one of the temples of the Druids, in which their religious rites were performed.

The shape of the supporting stones of the Cromlech at Palicondah is very like the configuration of those of a Druidical altar or Cromlech found by Mr. Borrow in Spain.

" Whilst toiling along these wild wastes" he says, " I observed, a little way to my left, a pile of stones of rather a singular appearance, and rode up to it. It was a Druidical altar, and the most perfect and beautiful one of the kind which I had ever seen. It was circular, and consisted of stones immensely large and heavy at the bottom, which towards the top became thinner and thinner, having been fashioned by the hand of art to something of the shape of scollop shells. These were surmounted by a very large flat stone, which slanted down towards the south, where was a door. Three or four individuals might have taken shelter within the interior, in which was growing a small thorn tree."*

* Vide Borrow's Bible in Spain Volume I. Chapter vii.

In beauty and capacity this Cromlech must greatly resemble the one I discovered at Palicondah.

The first sketch in the opposite page represents a remarkable and unusual description of Cromlech in the province of Malabar described to me by an eye-witness. These curious edifices are found surmounting the undulations of the country between Calicut and Paulghautcherry, especially near Ungadapooram and Mungary, at no great distance from the high road. They consist of a pedestal composed of three long stones slightly tapering towards the top, with their exterior surfaces rounded. These stones are fitted closely together, and form the frustrum of a cone. Poised on the top of them lies horizontally an immense oval or circular stone, its exterior surface being convex, while the inner is slightly hollowed. I was told by the person who described these Cromlechs to me, that one was opened by a Collector many years ago with much difficulty, when pieces of earthern ware urns, iron spear heads, and some gold ornaments were discovered.

In my account of the Cromlech at Palicondah, I stated my belief, that the ceremonies performed at such consecrated fanes were a perversion from the Patriarchal religion of sacrifice by fire on stone altars I am confirmed in this opinion by what is stated in the fourth, fifth, and sixth verses of the xxiv Chapter of Exodus.

" And Moses wrote all the words of the Lord, and rose up early in the morning, and builded an altar under the hill, and twelve pillars, according to the twelve tribes of Israel."

" And he sent young men of the children of Israel, which offered burnt offerings, and sacrificed peace offerings of oxen unto the Lord."

" And Moses took half of the blood, and put it in basons ; and half of the blood he sprinkled on the altar."

I have observed that the interior walls of some of the Indian Cromlechs are scored with rude representations of human figures, and unintelligible marks ; in which respect they may be compared with Saint Illtyd's house at Llanamllech in Brecknockshire, Wales, which is a Cistvaen, or Cromlech, seated on an eminence at a short distance from the village. This Cromlech consists of

three stones, supporting a fourth which on one side slopes towards the ground, (the case likewise with many in India.) The side stones within are inscribed with a number of strange characters scratched with the point of some sharp instrument. It should be observed that the Cromlech at Palicondah is raised on an artificial mound at the base of which are the two circles of stones; in a similar manner to those described by Mallet.

The conical shape of the pedestal overlaid by the flat stone, in the Cromlechs in South Malabar, reminds us of some of the Cairns in Wales and Cornwall, placed on the summits of mountains, and consisting of immense conical piles of stones having a large flat stone placed on the apex, and upon which the sacred fires were kindled.

### Tolmen.

In my account of the antiquities of the Neilgherries I described a Tolmen or "Hole of stone," and stated that a vulgar superstition attached, in England, to these apertures, to the effect that if children afflicted with weakness in their limbs were passed through the Holes they would be cured. A nearly similar superstition cleaves to these apertures in India. Mr. Grose in his voyage to the East Indies writes, "that on the extreme point of Malabar hill in the island of Bombay, is a rock flat on the top, in which there is a natural crevice, communicating with a hollow that terminates towards the sea." "The Gentoos," he adds, "use this place as a purification of their sins, by going in at the opening, and forcing their way (a difficult task as it appears for a corpulent person) through the crevice."

The Tolmen or Petra Ambrosiœ may be the "holes of the rocks" referred to by Isaiah.

The Tolmen was either a natural aperture formed by one rock resting upon the ends of two others, or it was an artificial and circular boring in the rock. The bodies of men were even passed through these apertures in ancient times in England, as it was believed that great effects were thereby produced.

### Upright Stones.

Since I wrote my account of the Antiquities of the Neilgherries in which I mentioned the existence of upright stones on those

mountains, I have enjoyed opportunities of examining some in the low country. At Pallipollium in the Salem district is an upright stone or slab eighteen feet high planted in the ground, a sketch of which is annexed. This stone has more of the Druidical character than any I have yet seen. Not far from it I discovered five Cairns, and a Cromlech. Near Peri Soondrum in Mysore I found two upright stones with some Cairns, and a Cromlech in the neighbourhood. This association of the Upright stone with the Cromlech and the Cairn, in India, occurs likewise in England, and Wales; and it is another striking proof that these curious antiquities are vestiges of the same religion.

Sir Richard Hoare says, in his Annotations to Chapter the second, of the Itinerary of Archbishop Baldwin, by Giraldus Cambrensis, when describing the Cromlech, near Llanamllech:

"A rude upright stone, as was common near Cromlechs, stood formerly on one side of it, and was called by the country people Maen Illtyd, or Illtyd's stone, but was removed about a century since by Mr. Walbeof, the lord of the manor, who made use of it in building."

At no great distance from the Druidical temple at Stonehenge, a huge stone sixteen feet in height used to stand; while within the entrance to the outer court stood another twenty feet high. These and other similar upright stones have been supposed to represent statues of a British deity called Ceridwen. Such stones were generally erected in sequestered spots favorable for the exercise of the ceremonies of the Druidical religion. Mr. Oliver pronounces these upright stones in England to be vestiges of the ancient Buddhic religion. We know that the Saxons, descendants of the Goths, or Asœ, also set up upright stones, and logs of wood, in the midst of circles of stones. A square upright stone called Herma represented Mercury both in Asia and Europe, he was a deity of the Druids, and by some supposed to be the same as Buddha.

The idol Manah of some of the tribes of the ancient Arabs, was nothing more than a large stone, in front of which, human sacrifices were made.

The upright stones, now our present subject, must not be con-

founded with the Hare or Hoar stones so called in England, and met with in India, as well ; which were in both cases, and still are in the latter, used to mark out the limits of pasturage, and cultivation. Many of these boundary stones still exist in England ; and in Wales where they are called Maen hir. They are very common in India. I saw two, side by side, and each ten feet high in a field, in the neighbourhood of Ballapoor in Mysore. Mention is made in Scripture of the use of such stones in the Patriarchal times. I give drawings of a Druidic stone in the Salem district and a group of three in Monmouthshire.

### Piles of Circular Stones.

At Courtallum in the province of Tinnevelly in the South of India, are three remarkable stones, of great size, poised in a singular manner, one over the other, on the ledge of a mountain. Their appearance from below has occasioned the name of "The Turk's Head" to be bestowed upon them. I have preserved a drawing of these stones, but my recollection of them is very imperfect. I am disposed to associate them with other Druidical remains in this country.

The Cheese Wring is a pile of rude stones rising to the height of thirty-two feet, and standing near the top of a hill, in the parish of St. Clear in Cornwall. The name is derived from the shape of the stones which is that of a large cheese. There are eight stones lying above each other, the uppermost was formerly a Logan or rocking stone, but the equipoise no longer exists. On the same hill are many other large stones, one of which is eleven yards long and nine broad. St. Clear also boasts of the Hurlers which when perfect consisted of three continuous circles of upright stones from three to five feet in height. All these stone remains are of Druidical origin. The Hurlers are precisely similar to the stone rings I have seen on the Neilgherries.

### Contents of the Cairns.

In enumerating the contents of the cairns of the Neilgherry Hills in a former number of this Journal, I mentioned that I had found beads, or nuts of crystal, of an oval shape, and pierced longtitudinally as though to receive a thread by which they might be suspended to the neck or arm of the wearer. It is very remarkable

how closely this relic resembles the amulets of the Druids found in the barrows of England.

This amulet crystal was variously shaped. Sometimes like a round bead of glass; at others, like a crescent or glass boat; now it was denominated a glass circle, and now a glass house. In each case it was a powerful talisman of protection; and its colour was merely the mark of distinction between the different orders. The Druid's crystal was white, the Bard's sky blue; the Eubates' green, and the aspirants' amulet was distinguished by a mixture of all these colors. The secret of manufacturing them rested solely with the Druids.

A splendid variety of this amulet was found by Sir R. C. Hoare in a large tumulus in the vicinity of Stonehenge, which Stukeley distinguished by the name of Bush barrow. It consists of a curious perforated stone of the kind called *tabularia*, moulded into the form of an egg, and highly polished, and containing in the veins of the fossil an intricate mass of small serpents entwined together in every possible combination. It is likely that these egg shaped crystals had some reference to the Anguinum or serpents egg, an object of Druidical superstition.

Bush-barrow also contained a rich breast plate of gold, in shape of a lozenge, and highly decorated with carved work, and devices. I was assured when on the Neilgherries, that a species of breast plate, or gorget, had been found in a Neilgherry cairn, and which was about the size of those used by the Druids.

In speaking of the Earthern ware urns found in the barrows of the Neilgherry Hills I stated that vessels of the same kind had been raised from the Deverel barrow in Dorsetshire. I have since learnt from Dr. Henry's History of Great Britain that "many urns of earthern were, supposed to have been the workmanship of the ancient Britons, have been found in barrows in different parts of Britain." The articles found in Silbury Hill, and neighbouring barrows by Dr. Stukeley are similar to those I discovered in the barrows of the Neilgherries, consisting amongst other things of spear-heads of iron, knives, gold rings, and fragments of golden ornaments, several large beads of amber, some of glass enamelled: some were of a white colour, others blue and azure.

SEPULCHRES.

Some very singular excavations were discovered between Luckington and Badminster, Wilts, called the Giant's caves. They are upon the top of a rising hill, in number about nine ; and some of them are or were formerly cemented with lime. Some of them are deeper, and some shallower, some broader and larger than others. They lie all together in a row. The manner of them is two long stones set upon the sides, and broad stones set upon the top to cover them. The least of these caves is four feet broad and some of them are nine or ten feet long. Sir R. C. Hoare pronounced them to be ancient sepulchres.

These are precisely similar to a kind of ancient sepulchre met with in India, and generally associated with Cromlechs &c. Within the precints of the village of Avanashy in the Coimbatore Zillah in the South of India, I was shown a deep excavation whence the stones forming a subterranean vault had been removed, some of which were still lying about the mouth of the hole, the large slab which covered the vault I was told had been sent to Coimbatore. In the neighbourhood of Secunderabad in the Deccan are numerous vaults or artificial caves, exactly answering the description of those in Wiltshire.

But the most remarkable I have seen, are at Wodenhully in Mysore. In the neighbourhood of this place, I found a vast number of subterranean chambers, formed of large flag stones, and all full of earth, the tops of the walls, each a single slab a few inches above the surface, only appearing. They differed from those I found on the Neilgherries, and from those in Wiltshire, in wanting the flag stones covering the roof, which, I suspect, had been removed in former times to Oosoor, or some place in this neighbourhood, as building materials. The Karkoon of Wodenhully asserted there were nearly two hundred of these curious structures, a statement I am well disposed to believe, because when I went to look at them, I felt as though I were walking over the remains of a large town that had been buried under the earth, or the cemetery of a great city. From my examination of edifices of the same character on the Neilgherries I arrived at the conclusion that they were ancient Sepulchres ; I entertain the same belief in this case as well.

XV.—*A sketch of the History of the Bhonsla family of Nagpore, taken from an old domestic of the Palace. (From the Records of the Nagpore Residency)* *November* 1811.

Cheema Baee the mother of the reigning Rajah,* in conversation with people of her household has often mentioned the following particulars :—

Ranojee Bhonsla, Patel of Hingunberdee, was in the service of Rajah Sahoo, (Rajah of Sattara) who promoted him to the command of his Pagah and gave him the title of Sena Sahib Sooba. Raghojee and Kanojee Bhonsla, his first cousins by the father's side, were in the service of Nizam-ool-Moolk Asoof Jah, and enjoyed Omraotee and Bham in jagheer from that Chief.

Ranojee had a son Pursojee who succeeded to the office of his father, and whose son Raghojee received from the Sahoo Rajah the Sicca and Kathar† and his shoes, with a command to take possession of any country which he might be able to conquer. Raghojee upon this came to Bham and lived with his relations Raghojee and Kanojee who had been employed in performing a sacrifice to fire for three years, and had cast into the furnace images of Khunde Rao and of Devee, each of gold to the amount of $5\frac{1}{4}$ maunds. When the last hand was to be put to the ceremony Kanojee had been too intimate with a dancing girl, and he accordingly told the officiating Brahmin to complete the sacrifice with the assistance of Raghojee, and to give to the latter the golden images, which was accordingly done. Some time after these things Raghojee first crossed the Wurda and began to plunder to the eastward of that river : in consequence of which the Gond Rajah of the country, Chand Sultan, opened a communication with him which terminated in a mutual friendship.

Chand Sultan's brother Akbar Shah was associated with him in the Government of the countries of Deoghur and Nagpoor. Ikbal Shah their first cousin by the father's side then ruled at Chanda,

* Raghojee the second who fought against us in company with Scindia at Assaye in 1803.

† Seal and Dagger, emblems of Princely rule in India.

of which country he was the independent Rajah. A battle was fought between Akbar Shah and Chand Sultan, near Khapa, in which the latter was slain; Akbar Shah soon after died a natural death. Ikbal Shah in consequence seized on the Government and having secured the wife of Chand Sultan, Taramuttee, known by the name of Rutton Koowar, with her son Boorhan Shah in Nagpoor, returned to Chanda.

Mahomed Ameer Khan of Chuppara was originally a servant of the Moguls. He afterwards served Chand Sultan, but subsequently engaged himself to Raghojee. Taramuttee, Chand Sultan's widow, wrote in these terms to Raghojee, "Our relations have deprived us of the Raj and even of subsistence, do you come to our assistance and recover the Raj, half of which you shall have in recompense for such a service." Raghojee on receipt of this invitation proceeded immediately to Nagpoor, accompanied by Ameer Khan, and the Pathan Chief who resided in Ellichpoor on the part of the Moguls. From the co-operation of the Ranee and her son, Nagpoor fell into Raghojee's hands without resistance and the army of Ikbal Shah fled to Patunsaongee. Raghojee followed and defeated it, took Deoghur and Ghurra Mundla, then conquered Chanda, &c., and returned to Berar; of the latter country he took a fourth and again came to Nagpoor. He next took Raepoor and Ruttenpoor from the old Rajpoot Princes; and soon after went on a pilgrimage to Benares, where he remained for six months and returned to Nagpoor. Here he was afflicted with a complaint in his back called "Pathraj" under which he suffered for three months.

Cheema Baee, daughter of Manajee Mohittea of Sattara, was married to Moodhajee at Sattara during the life of Raghojee and at Raghojee's death Moodhajee was sixteen and Cheema Baee eleven years of age. (The latter was about eighty, when she died in 1819.)

Raghojee had twelve wives, of whom two only gave him any offspring; viz. Soolla Baee and Balla Baee; the former his first and the latter his favorite wife or Putranee. Soolla Baee's children were Moodhajee, Bheembajee and a daughter Bhowanee Baee. Balla Baee's children were Janojee, Sabajee and one daughter, Baka

Baee. Janojee and Moodhajee were born on the same day; but the former in the morning and the latter in the evening. First, therefore, Janojee was elder born and secondly he was born of the Putranee (or favorite wife) and accordingly succeeded to the Raj.

Before his death Raghojee called his sons to him and spoke as follows: "Let Janojee have the Raj of Deoghur, the city of Nagpoor and the sovereignty: Moodhajee take Chanda, Sabajee the estates of Dharwar and those in Berar, and Beembajee Chutteesgurh and its dependencies." He also exhorted them to be unanimous.

But to return, when Raghojee returned from the pilgrimage, the great Sahoo Rajah being on the point of death, wrote a letter inviting Raghojee to Sattara to settle the affairs of the Raj. This letter the Peishwa intercepted and suppressed, and Raghojee was at the time sick; both of which circumstances prevented him from attending his sovereign in his last moments. Ram Rajah succeeded to the Musnud, although he was not the legal successor, and the Peishwa assumed the management of the affairs of Government.

After Raghojee's death, Janojee leaving his three brothers in Nagpoor proceeded to Sattara with a small force to receive the Khilut of investiture as successor to his father. Ram Rajah gave him the Khilut on the condition that Janojee should present nine lacks of rupees for the kitchen expenses and maintain ten thousand troops for the service of the head of the Mahratta Empire. In conformity to this condition Janojee with his contingent performed military service for the space of two years and then returned to Nagpoor. At this time grain was very cheap in Nagpoor as will appear from the following statement; wheat, gram, rice and doll, sold at Rs. 2 per candy; jowaree at Rs. 1½ per candy; and ghee at 12 seers for the Rupee.

Janojee's whole form and appearance was very like that of Pursojee the present Rajah's son, but he was thinner and more muscular. Moodhajee was in every respect like his son the present Rajah Raghojee. Sabajee and Beembajee were tall like their mother; but there is no one in the family now, who resembles them in features.

Janojee, as is said above returned to Nagpoor. Five or six years after his first vist, Janojee and Moodhajee went together towards Sattara, at which period, Nana Peishwa* came to the Godavery on his march to support the Bhow and Wiswas Rao, who had gone to the campaign of Paniput. Janojee met the Peishwa on the Godavery. The Peishwa was accompanied by ten thousand troops nearly all Mussalmans, and Janojee remained with ten thousand more and marched along with the Peishwa to the Northward of the Nerbudda. Moodhajee returned to Nagpoor from the Godavery. The Peishwa had advanced to Oojein, where he received the intelligence from Holkar of the defeat and death of the Bhao, and Wiswas Rao at Paniput, (A. D. 1760.) In consequence of which he returned with Holkar and Janojee to Poona. The latter were both with the Peishwa at his death and Madoo Row succeeded Balajee Nana Sahib,* and gave Janojee leave to return to Nagpoor.

After this when the Peishwa and the Nizam fought together in A. D. 1762 at Ratikur Bhoowun, Janojee told Moodhajee that as he had himself personally attended the Peishwa three or four times, Moodhajee should go instead for this time. Moodhajee answered that he had but few troops and little money. In consequence a disagreement took place between the brothers, but at length Moodhajee set off with all his family and troops and joined the Peishwa at Ratikur Bhoowun. After the battle Moodhajee remained a year in that quarter, and then, leaving his family behind him, came first to Nagpoor and afterwards to his own province of Chanda. For three or four years after this Janojee performed no service for the Peishwa, and sent no presents, in consequence of which he fell under the displeasure of the Poonah Court. Hearing that a storm was brewing, Janojee sent his own family and Sabajee's, and Moodhajee bringing his family from the place of their former residence, also sent his, to the fort of Gawilghur for security. Beembajee was in Chutteesgurh with his family, where he had been ever since the death of Raghojee, excepting that he had visited Nagpoor on two occasions of marriages in the family.

* The third Peishwa, son of the great Bajee Rao.

Janojee and Moodhajee having as above mentioned sent their families to Gawilgurh, went with all their forces into the district of Aurungabad. The Peishwa also came there with his army and a battle took place. The Ministers of the Peishwa privately advised Janojee to retire, and left the road open to him so that he fled to Nagpoor. Moodhajee remained concealed somewhere and Sabajee had not left Dharwar. The Peishwa did not attempt to molest Sabajee. When Janojee arrived at Nagpoor all the inhabitants, thinking the Peishwa's army would come and plunder the city, had fled to Pertaubgurh, Bedgong and Sapgurh in the hills of Berar. Janojee also proceeded to the Hills, and having comforted the inhabitants, paid his troops with 5 or 6 lacs of Rupees, which he took from Kuaroo Patel, a rich Zemindar. There is a tank called Kuaroo Patel kabund, which supplies water to several villages in that neighbourhood. Here the Patel was seized, and having realized all the money that could be extorted, Janojee with 4 or 5,000 horse without tents, infantry, or guns, went through the most unfrequented roads and jungles towards Poonah.

In A. D. 1766 the Peishwa came to Nagpoor and set fire to the town without the walls. Janojee in like manner burned the suburbs of Poonah. Gopikah Baee the Peishwa's wife, who was left as Regent, wrote to the Peishwa this intelligence ; in consequence of which the Peishwa marched back towards Poonah after remaining three days at Nagpoor ; and Janojee returned as he went to Nagpoor. The two armies crossed without meeting.

The Peishwa and Janojee continued for the rains at Poonah and Nagpoor, and after the rains Janojee marched with his army to Zerola a place on the Taptee river. Here about noon in 1772 Janojee received a letter from the Nizam. Immediately on hearing it read he was taken ill with a pain in his stomach. Raghojee, Moodhajee's son, was with him and Moodhajee was somewhere in the neighbourhood. Janojee finding his end approaching, sent for Moodhajee, and the brothers had a meeting. After which Janojee died about midnight. Moodhajee placed Raghojee in Janojee's arms, and gave him the Sicca and Kathar. Four concubines burnt themselves with Janojee, Jeewa, Jugga, Chandnee and Mukhomullie.

Darya Baee, Janojee's senior wife, had at this time come from Gawilghur to Ellichpoor on the occasion of the marriage of the Nabob's sister. At this place she heard of Janojee's death. Immediately on hearing it she came to Nagpoor with all the family from Gawilghur. The Peishwa sent the usual mourning clothes, and Raghojee and Moodhajee returned to Nagpoor.

The Baee procured the Khilut of investiture from the Peishwa for Sabajee, and he was seated on the Musnud. Sabajee had full authority for one year, whilst Moodhajee remained at Chanda, when a disagreement arose between Darya Baee and the former, and the Baee wished to give the Raj to Raghojee who was then 15 or 16 years of age. To proceed, Darya Baee and Sabajee both went to Bhooranpoor and the latter plundered the former with the assistance of some of the Nizam's troops. Open hostilities then began; the Baee returned to Nagpoor and Sabajee went to Nurnalla to Zuffer-ood-Dowlah, alias Dhounsa, the Nabob of Ellichpore, and exchanged turbans with him. He asked his assistance and offered to eat and drink with the Mussulmans to obtain his object; but Dhounsa told him that there was no occasion for his doing so, promised his assistance and told him to go to his own place with his mind at ease, and to call for him whenever he had occasion for his services. On this Sabajee came and fixed his residence in Berar. The Baee carried on the government for two years and a half by the hands of two brothers Deenajee Narrain and Appajee Punt. At the same time that Sabajee came into Berar from Nurnalla, Moodhajee also arrived from Chanda; they were separated by about ten marches. The Baee called for Moodhajee, saying that she would agree to settle the sovereignty on his son Raghojee. Sabajee at once wrote to the Baee and to the Peishwa in these terms:—"Why did you first give me the Raj and now try to take it away?" The Baee and Moodhajee were united, and Sabajee prepared for battle. The Baee heard that Sabajee's force was very strong, and sent Raghojee and Bala Baee his sister to pacify Sabajee, but in vain, for he detained them both and advanced to Paunchgaon. Moodhajee marched with his army from Nagpoor to meet him; but his forces were very unequal in number to Sabajee's. Sabajee was mounted on an elephant in a howdah, he seated his nephew Raghojee on another in

a howdah of a yellow colour with three Sirdars, ordering them to cut off his head in case of his own defeat or death. Their names were Lutchmun Rao Ghatkay, Lutchmun Rao Patunkur and Tookojee Nulloray. A battle took place, Moodhajee was on horse back and approached Sabajee's elephant. Sabajee threw a javelin at him without effect. Moodhajee shot his brother with a pistol loaded with two bullets through the head, and Sabajee sank and died instantaneously in the howdah ; Moodhajee immediately mounted his brother's elephant. That on which Raghojee was seated was in the rear of it and on Sabajee's death Patunkur drew his sword to execute Sabajee's last orders. Tookojee Nulloray restrained his hand ; Patunkur was wounded in the struggle ; and Moodhajee had him trampled to death by an elephant. The army detained Sabajee's corpse for three days as a pledge for their pay. On this Sabajee's two wives, daughters of two brothers of the Mohittea clan of Kenikotah, Yasodah Baee and Ahalyah Baee, being informed, they desired the army to come to Nagpoor with the body and supplicated the Chiefs to receive their pay from Moodhajee, or whoever ascended the Musnud but to release the body ; the army accordingly gave up the body. It had on a stuffed jacket ; but as it was much swelled they were obliged to cut it open : both his wives burnt themselves with him near the temple of the great Raghojee in Nagpoor. A Jharjee or plain sepulchral monument was erected on the spot. When the news of Sabajee's death reached Dhounsa, the Nabob of Ellichpoor, he marched towards Nagpoor. The female servants of the palace were sent off to Chanda, and the ladies to Gawilghur. With the latter went Vincajee Bhonsla being then about 8 years of age : Raghojee, Moodhajee and Chimnajee pitched their camp on the outside of the city. Dhounsa came to Nagpoor which was deserted except by the poor, and having remained encamped there for three days, during which matters were amicably settled between him and Moodhajee, he returned to Nurnalla. Dhounsa demanded that an illegitimate son of Sabajee's, named Hybut Rao, or more commonly called Dadajee, should be given to him to take care of, as being the son of a person with whom he had exchanged turbans. But Dadajee was kept in prison at Gawilghur, and Dhounsa went away without knowing where he was. He re-

mained imprisoned until ten years ago, when he was released; and he now resides at large but in a very humble position at Nagpoor.

When this business was over, Moodhajee carried Raghojee to Poona to obtain the Khilut of investiture for him. Raghojee obtained the old title of Senah Sahib Soobah, and Moodhajee as his Prime Minister and Regent, the title of Senah Sahib Dhoorundur, with the corresponding dresses of honor and the original conditions of service and tribute kitchen expenses of the Sattara Rajah. They then returned to Nagpoor.

Raghojee's first marriage with Gujra Baee the daughter of Kedarjee Mohittea was now celebrated, and Beembajee with his wife Annunda Baee attended this marriage. After which he returned as usual to Chutteesghur. After this all the women of the family and Moodhajee, Raghojee, Chimnajee and Pursojee (Raghojee's infant son) went on a general pilgrimage to all the sacred places of their native country. Raghojee returned from Pytun to Nagpoor and all the rest having visited Punderpoor and Nassick, went to Waee. From thence Chimnajee went alone to Badamee, and Moodhajee came to Sattara with the rest. The informant herself was on this expedition. The Rajah of Sattara entertained them with great distinction. At this time Pursojee Bhonsla, Raghojee's son by Gujra Baee, was 7 years old. Ram-Rajah gave him a Khilut and the Dawalee or belt of youth. A year after leaving Nagpoor, Moodhajee returned to it from Sattara, Gujra Baee having been with him during the whole expedition.

Chimnajee returned from Badamee six months after, and remaining a year at Nagpoor went to Cuttack, and having established the authority of the Bhonsla in those parts returned to Nagpoor. Chimnajee was very fat.

About this time Moodhajee persecuted a Tembekur Brahmin. The cause was a report that the Brahmin every day made offerings to Devee of arrack and flesh, being a Shaktee Poojaree. Moodhajee sent and seized all his sacrificial implements, and had them brought with the offerings of liquor and flesh before him in a full durbar. The Tembekur Brahmin was an accepted votary of

Devee. In the assembly the wine appeared as milk and the flesh as garlands of flowers. In consequence of this interference Moodhajee lay under the curse of the Brahmin and was for some days very ill, and became covered with leprosy. During his illness Raghojee and Chimnajee quarrelled about the succession to the Government. Dewajee Punt Chargore was Dewan at that time, and he remonstrated with the brothers, and pacified them; and then brought the Tembekur Brahmin after much persuasion, who prayed to Devee, and rubbed some ashes of Devee's sacrifice on Moodhajee's body, (Cheema Baee was herself present at the time) and Moodhajee instantly recovered, and his skin became like that of a young child. After this Moodhajee remained in health for six months; and Raghojee contracted a second marriage with Parbuttee Baee, of the Sirkya family. Moodhajee then made the following distribution of his dominions. To Chimnajee Appa he gave Berar with the Dharwar estates and Gawilgurh; to Vincajee Bhonsla called Manya Bappoo he gave Chanda and Chutteesgurh; and to Raghojee the Musnud of sovereignty, and all the rest of his possessions. Moodhajee died after this and was burnt near the Temple of the great Raghojee A. D. 1788.

After Moodhajee's death Raghojee went with about 10,000 men to Poona and remained there for four months. Thence he returned to Nagpoor. After this he celebrated the marriage of his son Pursojee, called Bala Sahib, with Kashee Baee daughter of Deo Rao Mohittea. Jhinga Baee, Raghojee's sister, died three days after the first anniversary of Moodhajee's death; through grief Cheema Baee eat nothing but fruit for three months. A month after Jhinga Baee's death Chimnajee Appa went on an expedition to Mooltye, and returned. He went to a nautch at Boodoo Khan Pathan's house, and came at midnight back to the Palace and eat some kitcheree; in the morning he was sitting at a window of the palace called the Hernawut Khirkee. Raghojee had a consultation with Bappoo Surdhoo, Soobah of Cuttack, and other four Brahmins on the subject of making away with Chimnajee. A slave of Chimnajee's was standing by when he was struck by "*mooth*," a species of enchantment; he shook his head. A second stroke caused his turban to fall off and at a third the blood began to flow from his nose and his neck fell on one side, and he

died immediately. Cheema Baee was hearing some of the Puranas read, she came running to the place. Chimnajee had had a bloody flux for two months, and some people said he was slowly poisoned, but there can be no doubt that he was destroyed by magic. It required twelve men to carry his body, which was burnt at the temple of the great Raghojee. When the fire was set to the pile some motion was observed in it, which led people to think that there was still life in the body. Vincajee the youngest brother performed the obsequies. After Chimnajee's death Cheema Baee remained three months in the apartments of her daughter, Balla Baee, who had married Yellojee Mohittea. Three months after Chimnajee's death, (A. D. 1795), Raghojee and all the family went to Chinnoor on the Godavery, on account of the Sreemunta. A year after this Cheema Baee, Vincajee and Pursojee went to Benares, and Raghojee remained at Nagpoor. A year after they returned, Raghojee went to the Khurdla campaign against Nizam-ool-Moolk, and returning from thence celebrated Balla Sahib's second marriage with Ahalyah Baee of the Palkur family. After this came the war with the English (the campaign of Assaye and Argaum) when Cuttack and Berar were lost.

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*An account of the Ministers of the Rajah of Berar and their duties, and of other officers immediately about his person in the year* 1811.

Sreedhur Pundit, a Roogvedee Brahmin, is the Persian Moonshee and the principal minister for foreign affairs and in fact may be considered as Premier.

Naroba Kaleekur, a Roogvedee Brahmin, is the chief adviser of the Rajah in matters relating to land revenue, and all the Amlah, treasurers &c. are under him.

Suddoba Abdeo a Roogvedee Brahmin, under the former, has charge of the Sillahkhanah or Treasury. Through his hands passes all the public revenue; and all questions of deficiencies or extraordinary advances below or above the assessments are managed by him.

Annund Rao Madhoo a Roogvedee Brahmin, is the Furnavees. All the accounts of the revenue and papers relating to the Per-

gunnahs are kept by him. The Furnavees of every Pergunnah is his servant, and every year each one presents him with a nuzzur of four or five hundred rupess.

Ramajee Punt Kurroo, a Roogvedee Brahmin, is a kind of steward of the household and private expenditure, and has charge of the secret treasure. It is his duty to examine all jewels purchased and to purchase them.

Bheekajee Punt, a Shenwaee Brahmin, is the Khasgee-walla and has the charge of the Khalsa villages, or those lands which the Rajah retains in his own hands.

Jyeram Punt Bhoot, also a Roogvedee, has charge of Nagpoor Khusbah Shahpoor, and is in fact Collector of the city.

Amrut Rao Pandoorung Roogvedee is Bakshee of the Pagah.

Ballajee Pundit, a Roogvedee, called Ballajee Jamdar has charge of the Jamdar Khana or wardrobe, purchases clothes, attends to the Ranee's requisitions, and provides Khilluts, and the clothes for the slaves.

Gungadhur Chitnavees and Naroba his deputy, who are both of the Purbhoo caste, write all Mahratta letters and purwanas.

Seooram Punt Kherkeer, a Roogvedee Brahmin, has charge of the Bukshee's duftur.

Naroba Rissaldar, a Roogvedee Brahmin may be called Military Secretary as he has charge of negociations with the troops and their several commanders.

Ramjee Tantia a Roogvedee Brahmin has charge of the female servants of the palace and of the Rajah's private trade &c.

Mahadajee Mukhlusee, so called from having formerly had the office which is that of an auditor, is now Furnavees of the army : all Tunkhwah assignments pass through him.

Ballajee Appa, a Yujoorvedee Brahmin, is the Pagah-walla, or Master of the Horse. Vittul Punt has the management of the Rajah's Bargeers or personal out-riders.

Alif-ood-deen has charge of the camels, and Furash Khana or Tent equipage.

Mahdajee Naik has charge of the Hurkarah or intelligence de-

partment. Jenardhun Bhow Prubhoo is Kamavishdar of Nagpoor.

Seoolalla is Jemadar of the Chobdars.

Dhurmajee Bhonsla has charge of the Chowree and city Police of Nagpoor.

Durkajee Barreedar has the keys of the Sillakhana.

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Appa Sahib's principal Officers are the following :—

Krishnajee Beroodee, a Roogvedee Brahmin is his Furnavees.

Madhoo Rao Bhokree, Roogvedee, is his chief adviser in managing his estate and in money matters, as Naroba Kaleekur is to the Maharajah.

Amrut Rao Jankoo a Roogvedee had formerly charge of the Pagah and was called the Pugnavees, but does not now hold the appointment.

Kasheenath a Yajoorvedee Brahmin, is Military Secretary.

Jaggernath a Yajoorvedee Brahmin, has the charge of Appa Sahib's banking houses.

A nephew of the late Krishna Rao brother of Gungadhur Chitnavees, holds that office under Appa Sahib.

Bapoojee Roogvedee has now the office of Pugnavees, and has charge of all the horses.

Khundojee Bhonsla has charge of the sillakhana and treasury.

Raghojee a Mahratta is Jemadar or keeper of the wardrobe.

Yenkut Rao, a Roogvedee, is the head of all the Pagah and above the Pugnavees in rank, but the latter has all the authority.

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Pursojee commonly called Balla Sahib's officers are Seed Rao Purbhoo the Dewan ; Appajee Panchpor the Jamdar; Bullum Doss, a Kayath, is general Manager of the household ; Krishna Rao is Pugnavees ; and Seeta Ram Punt a Kannojea Brahmin has the Sillakhana under his charge

Cheema Baee's officers since her death have been transferred to the Rajah's wife Parbuttee Baee, and are as follows ;—

Yasoba Patownee, a Roogvedee has charge of the Khangee, Khasgee, Pagah, and Jamdar Khana. His three sons are also employed as his assistants. Dhurmajee Bhonsla's son has charge

of the Chelas or slaves. Balla Baee the Rajah's sister left an adopted son Venkut Rao Mohittea who has a Dewan and Khasgee walla of his own.

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A statement of the different forms and signatures required to authenticate public documents :—

Orders on the Siilakhana or Treasury are addressed to Juggonath Bhonsla.

The word "Janoon de" was formerly written by Ballajee Kaleekur, now by his son Janardhun Bappoo, and his nephew Naroba.

The date and the words, "Bahoot Kayee leheena," were formerly written by the son of Oomajee Abba, Mohdajee Punt, but now by the Rajah's own hand.

The words "Sree Lukshmee Kaunt" at the head of letters dustuks and sunnuds, are written by Sreedhur Pundit. The date was formerly written by Baba Chitnavees who was the *Mookhya*, principal or original Chitnavees, now by his son Witul Rao Bappoo. "Bahoot Kayee Leheena" in sunnuds is written by the Rajah himself, and "Janoon de," which comes before it, by Anund Rao Furnavees.

The Sikka or seal was formerly with Dummajee Punt, but is now kept by Naroba Chitnavees. The word "Bar" at the end of all purwannas. is written by Gungadhur Chitnavees.

The seal which is used at present is that of the first Raghojee, and the Sanscrit legend runs thus: "Sree Shahoo Raj Pudambhoj Bhramarayite Chatas-ya-Beembatmajas-ya-Moodrusha-Raghojee-was-ya-verajate," meaning in terms—This is the seal of Raghojee the son of Beembajee, who flutters about the feet of the sacred Sahoo Rajah like the bee about the Lotus."

Scindia's seal is :—"Jotiswaroop charnee tatpar Mahadajee soot Dowlut Rao Sinde nirantar," which means,—"For ever a worshipper at the feet of the Self-Resplendent, Dowlut Rao son of Mahadajee Scindia."

The Peishwa's is :—"Raja Sahoo narpatee harsh nidhan Bajee Rao Ragonath purdhan," that is to say,—"Bajee Rao son of Ragonath, the Minister of Raja Sahoo, lord of the wealth and happiness of mankind."

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## XVI.—*Contributions to the Geology and Mineralogy of the Neilgherry Hills.* By Major H. Congreve.

> "And this our life exempt from public haunt,
> Finds tongues in trees, books in the running brooks,
> Sermons in stones, and good in every th ng."

### Mysore and Neilgherries.

During my hurried journey as an invalid through Mysore towards the Hills, my opportunities for Geological observation were necessarily very limited, however I do not hesitate to publish, because in the present state of Geological Science every thing contributing to increase our information must be valuable.

Ramghur.—About three miles to the eastward of Ramghur, rising from the plain, are a number of white rocks the partial disintegration of which has afforded the surface soil. On examination, these prove to be aggregations of felspar crystals with a few grains of quartz disseminated.

Sindhully.—In the undulating configuration of the surface of this part of Mysore, the Geologist at once recognises the metamorphic formation, the Rocks of which seem to be suspended, as it were, between the distant Primary Hills. A section of the surface in the bank of a nullah discovered strata of Mica slate, Hornblende Gneiss, and common Gneiss. The Micaceous Schist is passing into clay slate ; it contains elongated plates of mica of a greenish color bearing a resemblance to badly pronounced crystals of Pyrophylite. Hornblende Gneiss is a rock I have never before met with in this country. It differs from common Gneiss in having small laminæ of Hornblende substituted for the plates of mica.

The soil is a red earth ; the degradation of the rocks so far advanced to ruin as to comminute between the fingers : even the quartz dispersed over the surface of the country in pebbles and angular fragments, pulverises in like manner. Broken pieces of a greyish conglomerate are also met with. I was unable to ascertain the dip of the Strata.

Goondulpett.—The plain between the Bungalow and the Fort is strewed with fragments of conglomerate and porphyry. The

latter has a gangue of compact Felspar, embodying small crystals, of various minerals. It approximates to the Elvan of the Cornish Miners. My friend Doctor Burrell detected this rock cropping out in the Fort ditch, associated with Gneiss, Hornblende Rock, and Limestone.

## Neilgherries.

The labours of De Benza and others have thrown considerable light upon the Geology of the south and west districts of these Hills. To the north, and east, there is an extensive scope remaining for further research. To these points I shall principally direct my attention.

I briefly premise by saying that the absence hitherto of Secondary and Tertiary Rocks, as well as of organic remains, has induced the belief that the Neilgherries were elevated at a period long anterior to the existence of those formations.

Soils.—Beneath the vegetable soil is a diluvial stratum (hereafter to be noticed), super-imposed upon a red soil ; obviously the decomposition of the Hypogene Rocks subsequently indurated into a wackke.

The best proof I can adduce to this notion, is a section of the Hill at the point where the surplus waters of the lake at Ootacamund are discharged. In wet weather the Geologist may discern in this mass of clay, striped and mottled with a variety of colors, the remains of Granite, Greenstone, and Syenite. In some places white bands traversing the mass, indicate what was once a mass of quartz ; in others a black substance crossing the bed denotes the former existence of a trap vein. At places where the rocks have had Felspar for their principal ingredient, the clay becomes a Kaolin (Porcelain clay), this is used for white-washing the houses on the Hills.

White, yellow, and red are its colours, derived from the varying proportions of the iron in the Hornblende entering into the composition of the old rock. The wackke occasionally passes into a Tufa, colored yellow by oxide of iron which soils the fingers.

Masses of a white mineral are met with on the sides of the Hills, that considerably resembles indurated Lithomarge. It adheres to

the tongue, is polished by the nail, has a conchoidal fracture, when treated *per se;* before the blow pipe hardens into a white enamel ; it does not make a paste with water, nor fall to pieces when submerged in it ; occasionally it is veined with yellow and blue : is not acted upon by muriatic acid : an action, though very feeble, taking place under sulphuric acid, would denote that the greasy feel of this mineral arises from the presence of magnesia. Zeichenschiefer or black chalk I have found in a valley north of Ootacamund.

ALLUVIUM.—Under this head I first notice the turf swamps, or as they have been called peat bogs. These lie in hollows excavated in the red soil by running streams, and in the low valleys.

The lowest stratum of turf probably consisted of decomposed ferns and grasses transported from the Hills by those streams and rain. Grasses then growing on this foundation, decayed and furnished a fresh soil for another crop, which in process of time gave place to a third derived from the seeds of the preceding ; thus these grasses not only gave birth to a progeny, but likewise decomposing into turf contributed in the sequel to nourish it. I shall have further occasion to glance at this method of vegetable propagation, in speaking of the diluvium of these Hills, and I may add here that the production of the ferns is a further instance of it.

Passing through a fern field I have observed the living ferns rearing their heads over the ruins of a former crop, now lying bent down beneath them, and gradually passing into a vegetable soil. It is a matter of considerable surprise to me that these turf swamps have not been more largely turned to agricultural purposes ; the deltas of some of them have certainly been drained by the natives, cleared, and used as gardens.

Rice sown would I apprehend yield an abundant return. The turf of these morasses seems to be of very recent origin, stems and leaves of grasses being still entire in it. Specimens containing a small proportion of earthy matter will burn many hours. Under a blast from a pair of bellows, or a blow pipe, a beautiful blue flame is elicited, accompanied with a slight bituminous odour. The depth of the turf of course varies.

No remains of animals of extinct species, as far as I can collect, have as yet been discovered.

The Hill streams disengage from the banks of their channels small fragments of the primary rocks, and deposit them in their beds, they are usually angular fragments, being too near their gangues to be yet rounded by attrition. In the sands of the Ootacamund lake are small pebbles of quartz, which if possessed of a deeper shade of green would be called Prase.

I must not overlook the deposit of a soft unctuous scarlet ferruginous mud, from the waters of some rills in a valley between Ootacamund, and Chinna-Coonoor. Where the waters have partially stagnated, they are encrusted with a *chatoyant* film; the taste is usually that appertaining to chalybeate springs. I shall take occasion in the sequel to refer more particularly to those waters.

Diluvium.—There is every reason to suppose that the deluge took these Hills within its scope.

That this flood swept over the mountains in a torrent from the Eastward, is manifest in the position of the Erratic blocks and Boulders, which lie generally along the western slopes and bases of the eminences. It is also confirmed in the arrangement of the Diluvial stratum, in the presence of conglomerates cemented by an indurated clay of aqueous origin, and, what seems singular to assert, in the greater luxuriance of vegetation on the Western faces of the Hills. The boulders and blocks consist of granites, Eurites, Syenites, and greenstones, chiefly resting on the red soil into which some of them have sunk partially owing to their great weight; many of them have been rounded by attrition during their head-long flights while suspended in the torrent. Occasionally they are seen in groups, sometimes wholly detached.

Between the vegetable soil, and the red earth which had probably commenced decomposing before the Deluge, lies the diluvial detritus, consisting of fragments of various rocks here met with, sometimes rounded into pebbles. The detritus in many cases may be seen to have fallen into rents in the substratum. This deposit cannot be classed as alluvial, for no casual overflowing of streams or ordinary rains could have deposited it where it prevails,

Moreover were it of such recent origin, we should expect to find below, in a blackened soil, evidence of former vegetation ; such however may be looked for in vain.

I have observed that the ravines and vallies on the Western sides of the Hills are more fertile than in the opposite direction, this corroborates my opinion regarding the direction of the flood from the Eastward. At the time the waters began to subside, the body of them still flowing Westward, partial stagnations took place under the western sides of the mountain ridges acting as breakwaters upon the torrent. In such tranquil spots it deposited soil in the ravines which shortly gave birth to forests. These forests at a subsequent period, in their ruin by the hand of time, created another vegetable crust for younger trees, an operation that has gone on ever since, and still continues. On the other hand, the Eastern sides of the ridges being exposed to the current of the waters, could hold no soil, and it was not until a long subsequent period that vegetation took root in a stratum derived from the disintegration of its groundrock. The conglomerate and garnet pudding-stone, on a future occasion to be described more fully, are evidently of aqueous origin, being consolidated by a clay made by water.

There cannot possibly be an objection to citing Holy Writ in support of an hypothesis which, when proved to be true, in return tends to corroborate the truth of the Scriptures. In the seventh Chapter of Genesis in the 19th and 20th verses it is said :—"And the waters prevailed exceedingly upon the Earth, and all the high Hills that were under the whole Heaven were covered." "————And the mountains were covered." 18th verse—"And the waters prevailed and were increased greatly upon the Earth, And the Ark went upon the face of the waters."

Now the expression "*went upon the face of the waters*" obviously implies the existence of a current that carried the ark onwards. Let us next endeavour to ascertain from the voice of tradition, historical record, and the same high authority, the direction in which the Ark was propelled. An universal opinion prevails that the family of Noah and his ancestors were settled somewhere in Central Asia previous to the flood. It is fair to suppose, that at the

subsidence of the waters, Noah would endeavour to return to his own country; we therefore find the names of his descendants perpetuated in the names of countries in Central Asia. Thus Cush gave rise to Cushmere, Cushgur, Cuthy, Cutch, &c., Ninus or Nimrod to Nineveh, Assur to Assyria, and so forth. In the Chaldean history of Berosus, preserved by Alexander Polyhistor, we find Xisuthrus (Noah) and his family embarked in an Ark at the Deluge; and that subsequently the family returned to their former country. Again in the VIII Chapter of Genesis, at the 4th verse, we are told that the Ark rested on Ararat in the Corcyrœan mountains of Armenia.

Javan the son of Japhet was the first man, by historical record, who emigrated to Europe, where he probably founded the Pelasgian Colony. Such being the case, Noah could not have sailed Eastward from Central Asia in his Ark. Armenia is a region on the Western confines of Asia. This is all strong circumstantial evidence that the torrent of the flood swept over the face of the earth in a westerly direction.

About a mile north of Ootacamund is a mountain peak called Snowdon, a favourite resort of parties from the Cantonment. Considered one of the highest eminences, it may be recognised by a beacon on the summit, and forms one arm of a most picturesque amphi-theatre of hills opening to the northward. Another peak corresponding in appearance and nearly in size, comprises the Eastern branch of this concavity. These peaks with other heights in the same direction, are spurs from the mountain of Dodabett, and form the heads of ridges which slope gently down towards the margin of the plateau, where they are met by other ridges falling abruptly on their north side in mural precipices into the plains of Mysore, except at the point where a mountain range branches from the Hills across the low country. The vallies betwen the ridges first mentioned, appear to have been scooped out at the recedence of the waters of one of the Deluges that flooded the earth before the existence of man. These vallies are highly cultivated. The Hill of Snowdon, with the ridge descending from it, preserve a North East, and South West direction, forming one boundary of the valley of Ebenard.

Crossing this Hill shortly after my arrival from the low country, I was struck by the appearance of the stones dispersed upon it, and on examination found they were pieces of Siliceous Schist, a rock, I apprehend, that has hitherto eluded the observation of the Geologists who have made the Neilgherries the field of their research. I discovered the vein of Schist appearing at the surface, half way down the Eastern *talus* of the mountain, and subsequently tracing it to the North East side I found a section two hundred feet broad associated with Trap, and forming a flight of natural steps which lead from the peak to the ridge below. At a more recent period, following the direction and dip of the vein, which are identical, I found it again displaying itself more to the Southward, and a long way down the declivity. Pursuing this line I encountered pieces of it in a bank near General King's house in Ootacamund; and a little further on it occurs in great abundance, though in fragments, in the bank of a morass, where it assumes an argillaceous character. Notwithstanding that no direct evidence of the vein traversing the Cantonment exists, I am induced to believe these fragments are outlying pieces from it, because they maintain the line of strike with but little deviation. The dip of the Schist, as observed by me at Snowdon, is about 40 degrees to the South West.

The South West slope of the peak is conformable to this angle. The Hill itself is a mass of Syenite, varying from the red rock of Egypt to what has been called Greenstone Syenite, but is really Green Syenite, through the inconstant proportions of the Hornblende it contains, the changing colors of its minerals, and an alteration in the size of their crystals. Northward the Schist terminates at the Trap stairs, but an extension of the latter rock has occasioned those along the ridge to affect the Schistose character in an inconsiderable degree. On the whole I compute I have traced the Schist to a distance of two miles.

This interesting and remarkable vein consists of the following materials.

(*a.*) Siliceous Schist passing into,
(*b.*) Lydian Stone, passing into,
(*c.*) Siliceous Jasper passing into,

(*d.*) Green Jasper, passing into a brown variety,

(*e*) Siliceous Schist passing into Hornblende Schist,

(*f.*) Ferruginous Clay (A in Macullock's Synopsis of clays,)

(*g.*) The above Clay converted into Porcelain Jasper,

(*h.*) Small Crystals of Sahlite diffused between the joints of an altered Schist.

(*i.*) Traps that have wrought the above mutations, comprising compact Hornblende, Hornstone Trap, and Porphyritic Trap containing green earth in Crystals of Felspar.

(*a.*) The Siliceous Schist has generally a dark greyish color, occasionally almost white. It is a concretion of thin laminæ of quartz, and is very hard except on the weathered surfaces.

(*b.*) The Lydian stone is nothing more than the Schist in a compact state and of darker hue. This is the touchstone of the Goldsmiths.

(*c.*) The Siliceous jasper is the Schist in an altered state, having a dirty white base banded with yellow, green, and brown. Polished, this stone would be an acquisition to the Mineralogical cabinet.

(*d.*) The next jasper possesses a fine green color traversed by stripes of a darker complexion.

Probably it owes its color to the green earth suspended in the contiguous Trap. This jasper is not quite so hard as the preceding variety, its edges are translucent, the fracture is somewhat conchoidal.

It is rare. It passes into a light brown variety with white stripes

(*e.*) With regard to the Hornblende Schist, it would seem that the Trap has parted with a portion of its Hornblende, and by insinuating it between the leaves of the Schist converted it into a kind of Hornblende slate.

(*f.*) Ferruginous clay next comes under our notice.

This indurated clay or wakke, fractures into rectangular and doubly oblique prisms. It has a yellow streak, and is of considerable specific gravity owing to the iron impregnating it, which soils the fingers. Where this clay has come in immediate contact with the Trap it has been altered into a Porcelain jasper (*g*) of a light

fawn color, with white, black, and dark brown spots and streaks. Phillips calls this mineral Porcellanite, and does not consider it a true jasper. It has the appearance of baked clay.

(*h.*) The crystals of Sahlite (a variety of Augite) being partially decomposed, have lost much of their original character, the primary form of crystallization and the green colour however still remain. The longer axes of all the crystals maintain the same direction in the gangue.

A particular notice of the Traps is deferred to a succeeding paper.

Having thus described the materials composing and combined with the vein of Siliceous Schist, I will endeavour to account for its origin and singular conditions.

It is easy to conceive, at some remote period in the Geological era, that the primary rocks by some internal convulsion were rent into fissures and chasms, subsequently filled, as in the present instance, by Trap, and Siliceous Schist, &c. ; but it is more difficult at once to determine whether the Trap in its passage through the chasm converted the sides of it (under present circumstances consisting of Syenite) into the Schist, or to pronounce whether the Siliceous Schist was in the first instance injected from below in a mass of soft matter, subsequently partially indurated by time and altered by Trap afterwards.

In other words to decide whether the Trap is of contemporaneous origin with the Schist, or the Schist older than the Trap.

In favor of the first hypothesis is the important fact that the sides of the chasm in the Syenite (exposed in a mass of rock cropping out from the side of the Hill) affect the Sehistose structure : while on the other hand is the following evidence in support of the theory, that the Trap must be of more recent origin than the Schist, viz, its passage through that rock and the alteration it has produced in converting it into jaspers.

These two views are so equally balanced that it is impossible to decide in favor of either of them, to the utter exclusion of the other. I therefore come to the conclusion that the chasm was first filled with Siliceous Schist, and the Trap afterwards obtruded

through it, and against the Syenite imparting to the latter a Schistose character.

Taking a general view of the subject, I also conceive the chasms and fissures opened in the crust of the earth, were the ducts through which the waters that at different periods deluged it, found their way to the surface.

It is not impossible, either, that the Siliceous Schist owes its origin to contemporaneous circumstances, being a sediment from the muddy waters that passed through the fissure near the conclusion of a cataclyson.

Further examinations of these Rocks have confirmed the idea of the Trap being more recent than the vein of Schist.

It may be seen traversing the latter in various directions, contorting it in a most remarkable manner. In some sections the Trap has the contour of a wedge, confessing it has inserted itself into a fissure.

Latterly renewing my researches along the ridge below Snowdon, I found the same Trap vein that intersects the Siliceous Schist, bursting through the sequestered bank of one of the horse shoe hollows met with in the acclivity of the ridge.

Instead of compact Hornblende I found it now under the form of Basalt (compact Felspar and Hornblende aggregated, with brilliant Crystals of Augite) which when fractured presented very sharp edges.

Some convulsion subsequent to its projection had split the vein of Basalt into two masses, one of which, fallen against the other rested upon it, forming a natural arch between the two, Schistose, quartz, and Jaspery rocks, were associated with the Basalt, and confusedly blended with it in the mass, confirming my view of the passage of the Trap through the Quartz Schist.

The surfaces of the Basalt had assumed a puce color in many places.

Scattered around the base of the vein I observed a few pentagonal basaltic blocks, mixed with fragments of jasper, Schist

porphyries, and Lydian stone ; some of these I collected and present a list of:

1, Jasper marked with red waves on a white ground, passing into green and red.

2. Lydian stone traversed by veins of variously coloured Porphyry, from brown to grey, environing chrystals of Felspar, Amygdaloidal aggregations of Felspar, and dark green quartz, dusted with pulverulent chrystals of Augite. The base of the Porphyry is an indurated clay, having a streaky, almost fibrous structure, and occasionally an Agate figuring.

3. Red Porphyry enveloping the same minerals as the former and travering quartzose blocks.

4. Schist with iron inserted between its leaves (this occurs in transported masses West of Snowdon).

Quitting the Basalt I proceeded along the ridge, and found it consisted chiefly of Syenite with protruding massses of garnet rock along its Western side. I broke out of one of these pieces a garnet an inch in diameter.

From some of the Syenitic blocks in this locality, project serrated ridges of Quartz the crests of Quartz veins. They furnish good indications of the original capacities of the blocks, the ingredients of which have decomposed and disappeared, leaving the Quartz standing out. Nearly at the bottom of the ridge, where it meets the terre-plein of the valley, terminations of masses of Syenite project through the side of the Hill.

Piled on each other they form natural caverns.

The declination of the lateral natural joints of these rocks (for they are generally split into prismatic blocks) at an angle seldom under 25° from the horizontal line, is a remarkable feature in the Geology of this valley, and the fact receives an accession of interest when we find the interior slopes of the eminences flanking it conformable to this dip, and remember we have seen the Schist and Traps preserving the same declination. The expression dip, is perhaps inadmissable when speaking of un-stratified rocks, but there is no other that so well describes the slanting direction of rocks whose lateral lines of cleavage are not horizontal.

I have said that the Basalt appears in the bank of a horse-shoe hollow, in a ridge branching from Snowdon. These hollows are very common along the sides of the hills. They are distinct from the ravines, the origin of which is due to the degrading operation of running water, as well as from land slips, and I am disposed to consider them as excavations wrought by the action of eddies in those torrents that scooped out the contiguous vallies.

In the neighbourhood of these hollows, traversing a mass of Syenite, is a Pegmatite consisting of large chrystals of Felspar concreted, and traversed with plates of Prase Quartz. Between the Chrystals of Felspar very delicate dendritic stains of oxide of manganese occur.

In taking leave of the subject of the Schist, to describe which has been the paramount object of this portion of the paper, I have to add that transported pieces of it occur in the valley to the West of Snowdon, associated with numerous blocks of common syenite, green syenite, and garnet rock.

A variety of metalloidal diallage occurs in this locality: this mineral has a silky shining lustre in one direction, is of a reddish brown color, sometimes greenish and like bronze, and has a lamellar structure with indications of a prismatic primary form. Under the Blow Pipe, *per se*, it loses its color, becoming black and more compact; with borax fuses into a green glass bead. Streak grey; yields easily to the knife; contains a small proportion of oxide of iron. Resembles, in some respect or other, Hypersthene (Labrador Hornblende) Schillerspar, and Bronzite, all Diallages.

Returning from the heights above Snowdon to Ootacamund, one is struck with a resemblance of the bason in which the Cantonment stands, to the crater of a volcano in a state of repose, but this notion is entirely unsupported by facts, as there is nothing to shew that one ever existed,

Having accomplished my survey of Snowdon, the peak of which is now almost always enveloped in a mantle of mist, I addressed myself to investigate the character of the rocks of the amphitheatre of which it forms one arm.

This highly picturesque hollow is furrowed by subordinate vallies, separated from each other by buttresses of rock projecting boldly into the arena, and descending precipitously into the valley below.

In many places these crags are almost inaccessible. The intervening vallies are cut by ravines formed by running streams, whose banks are thickly wooded, and afford shelter to elk, wild sheep, black panthers, and other denizens of the forest.

The confluence of these streams, at a point a considerable distance down the valley, is the spot from which the scenery of the amphitheatre is most striking. Thence the united waters pursue their course towards the margin of the Hills, descending in cascades, and cataracts, till they reach the precipice, over which they must be cast in a magnificent volume of water; the case, I suppose, with all the streams that fertilize the vallies here.

The buttresses which seem to support the amphitheatre, slant out of the perpendicular at a considerable angle to the southward; in other words their horizontal lines of cleavage, or the bases of their prisms, have been elevated on the north side by a force from below, which operated prior to the excavation of the amphitheatre, and subjacent valley.

The rocks of these buttresses consist of :—

1st.—Compact Felspar, Quartz, and Mica, closely aggregated, and presenting a red color when fractured. With a view to obviate the necessity of constantly mentioning the ingredients of a rock when speaking of it, I take the liberty of specifying such varieties as have not yet been distinguished by any appellation.

Accordingly I bestow upon this rock the name of red compact granite.

2nd.—Compact, Felspar, Quartz, and Mica, of a greenish colour, With equal propriety this may be designated green compact granite.

By the addition of hornblende it would pass into green syenite.

3rd.—The same ingredients, but presenting a white color when fractured. In this rock the Quartz is arranged in plates parallel

to each other, and to the transverse joints. The rock on its weathered surfaces is of a white color, and the laminæ of Quartz are more distinctly seen.

4th, 5th, 6th.—Red, white, and green compact granites, containing garnets. These rocks are extensively diffused in the neighbourhood of Dodabett.

Compact Felspar enters so largely into the rocks of these Hills, that I am actuated to subjoin a list of those I have met with containing it.

1st.—White Syenite, being nearly all compact Felspar with a few grains of Quartz, and Hornblende, disseminated: the edges of this rock when fractured are sharp and highly translucent—it is occasionally striated with Hornblende.

2nd.—It passes into red syenite with the same ingredients. An opinion has recently been started, that the Logan Stones common in Britain, are not the works of the Druids, and ancient inhabitants; but the result of decomposition. I have now before me a natural model in red Syenite, of one of those stones, which I found near Snowdon.

It contributes greatly to sustain the new theory relative to the origin of the Logan Stones.

The red syenite when decomposing has its surface traversed by cracks intersecting each other.

3rd.—Brown syenite of the same ingredients, and sometimes containing common Felspar.

4th.—Green syenite, the same ingredients with a highly crystalline texture, both large grained and fine. This rock has been improperly called green stone, and green stone syenite, the misapprehension arising from its color. It is of very common occurrence.

In some pieces I found at Kulhutty on my way up the Ghaut, Cinnamon stone, and Smaragdite occur, garnets are also found embedded.

The rounded summits of the Hills in the neighbourhood of Ootacamund, are occasioned by the concentric exfoliation of this rock,

which has a conchoidal fracture ; is very sonorous, ringing loudly under the hammer, which rebounds from it. Its green color is derived from the Quartz. By the disappearance of Quartz this stone passes into—

5th.—Green stone consisting of compact Felspar and Hornblende. This is known as Whinstone in Scotland. It is of a blackish grey color and one of the most common overlying rocks. Occasionally it has phonolite as a base. It passes into—

6th.—Basalt of which I have observed three varieties, viz.—Compact Felspar and Hornblende, so closely aggregated as to give the rock the appearance of an uniform mass.

The same ingredients as the preceding, containing dull, crystals of Hornblende.

The same rock, containing brilliant crystals of Hornblende and Augite : the latter recognizable by their pyramidal terminations. These Basalts have a dark blue-grey color.

The Smaragdite found in the green syenite is a diallage of a fine green color, and pearly lustre in one direction, having a lamellar structure, and fusing with much difficulty (after hardening into a dark greenish enamel), with borax, into a beautiful amber bead.

The term Smaragdite to me seems attended with some inconvenience, inasmuch as this stone may be confounded with the expression " Smaragd"—the German name for the beryl and emerald.

To return to the amphitheatre, its eastern arm, the peak opposite Snowdon, consists of compact granite containing garnets, which I shall hereafter, for a reason previously assigned, denominate garnet rock.

It is traversed by veins of Quartz, and shelves down almost perpendicularly from the summit, in escarpes to the north and east.

Between this peak and the north flank of Dodabett, the garnet is found in great abundance in rocks protruding through the surface, in detached blocks of red compact granite which affect the Dodecahedral form, the primary crystal of the garnet, and in a conglomerate. The surface of the ground is actually reddened from comminuted garnets. Many of the rocks are traversed by

veins of Quartz loaded with garnets, some in an entire state, and others run into a mass, manifesting that the Quartz in a liquid state traversed the garnet rock, and in its passage through it, caught up the garnets, vitrifying many of them.

Detached pieces of these veins are scattered on the surface, and present a cellular form, owing to the garnets having decomposed and fallen out. The black garnet occurs, though rarely, in this locality. Amongst other specimens I collected here are.

A stone consisting wholly of very small dark red garnets aggregated.

An ochreous scaly iron ore found in fissures of the garnet rock, being an aggregation of thin orange yellow scales, dull in one direction and presenting a waxy lustre in the other. The numerous plates intersecting and lying on each other give the specimen a striated aspect. On being touched by the finger, the scales adhere to it and soil strongly. Touch meagre. The mineral is a peroxide of iron. It is associated with shining scales of another iron ore.

The garnet conglomerate has a matrix of indurated clay, in color varying from lead blue to a dirty yellow. It includes numerous Garnets and fragments of Quartz and Felspar.

This conglomerate is accompanied by a Breccia, having a similar base enclosing angular fragments of white and Amethystine Quartz, pieces of Felspar, and red blotches, evidently the remains of decomposed garnets.

The very frequent association of garnets with iron, in connection with the extensive diffusion of these minerals on the Neilgheries, is a subject worthy of attentive consideration. At present I have before me a piece of Quartz vein broken out of a rock full of iron, for the sake of a remarkably fine carbuncle (precious garnet) embedded. The Quartz is entirely crystalline the result of slow cooling, and is of various colors due to the contiguous iron. Carbuncles of different sizes, from an inch in diameter to such as are objects for the microscope, are included in the Quartz, having their edges and angles so fused and run into clots, as to obliterate, the crystalline form. Empty geodes in the Quartz, the concavities of which are impressed with marks, and indentations, correspond-

ing to the configuration of the adjoining altered garnets, also occur. From these appearances, it would seem, that the garnets, their surfaces being previously fused by heat, were submerged in melted Quartz that had lost tne amount of caloric adequate for their further fusion and was beginning to crystallize. In this instance I apprehend the garnets were projected from below, along with their matrix. In many cases however I am of opinion that cavities in Quartz veins form natural alembics (like the geodes in volcanic rocks enclosing zeolite minerals), in which electrical or other powerful natural agents operate to produce garnets; the ingredients silica alumina, iron manganese, &c. being derived from the adjoining rock.

In proof of this latter surmise I may mention that I have garnets in my possession containing small crystals of Quartz, which fell from the sides of the cavities into the mineral while it was in a fluid state.

Returning from the garnet valley, I found my way back to the Cantonment over a route totally different, entering Ootacamund by descending a hill immediately behind Dr. Wight's house: this eminence seen from the Cantonment has a conical appearance but its real shape is the frustrum of a pyramid.

Garnet Rock is its base, overlaid by iron which occurs under the following conditions.

(*a.*) Encrusting a rock probably the same as the base of the Hill, but now hastening into a crumbling sandstone from the absence of the compact Felspar that cemented it. The surface of this rock is cavernous, and possesses a decayed appearance. The iron has followed the exact configuration of it, however and entirely coated its exterior, manifesting that decay had commenced to take place prior to its being invested by the iron.

(*b.*) As iron mica diffused throughout the interior of the same rock.

(*c.*) In veins traversing the rock.

(*d.*) In veins running down the side of the Hill, and embedded in the soil.

(*e.*) In masses dispersed over the surface, and consisting of aggregated crystals.

From these effects I induce the following history of this ore.

(*a.*) First a vein of iron came to the surface through the body of the Hill, and overran the rocks upon it.

(*b.*) It percolated through the pores of the decaying rock and crystallized into iron mica.

(*c.*) Where fissures existed in the rock the iron formed veins.

(*d.*) Overflowing the surface of the Hill the metal ran down its sides in thin streams, and lastly.

(*e.*) In concavities of the surface the molten iron settled, and by the process of slow cooling crystallized.

The soil having subsequently degraded from around the masses of the metal, left them exposed on the surface.

Some of the out lying fragments of the ore contain cells lined with crystals of quartz.

Pieces of the ore also occur with botry oidal surfaces, hollow inside; these have been evidently crusts of a rock which has disintegrated from beneath them.

*Oxydulous Iron* (native loadstone) some pieces powerful enough to raise a needle, and Ferruginous quartz are associated with this ore, of which I now annex a mineralogical definition.

*Regularly Crystallized Iron Glance*, which Griffin includes under the head of red Hœmatite, Phillips separates one from the other, and calls the ore Specular iron *specific gravity* 4·28 which is 0·72 under that of Elba, a discrepancy arising I conjecture from the number of cells in the Neilgherry ore filled with earthy matter.

*Primary Crystal.*—Acute rhomboid. *Hardness*—between quartz and Felspar. *Streak red. Chemical analysis* proves it to be a peroxide. *Magnet* acts on its dust. *Color*—dark steel grey. *Lustre* highly metallic, and sometimes tarnished.

The Hill on which the above ore occurs, is separated from the North West flank of Dodabett by a stream and road.

In the surface of the latter, Doctor Burrell found the same

ore under the form of alluvial pebbles, which I apprehend were thrown up from the bed of the stream at the time the road was made.

Doctor Burrell also discovered here a variety of the iron ore which I shall immediately describe.

This excited us to prosecute our researches, and in the sequel we found on the same side of Dodabett, occurring in heaps where clearings had been made in the jungle, and protruding through the surface in blocks, the following remarkably beautiful ore of iron.

*Splendent Scaly Iron Glance.*—Variety of red hæmatite. Color in the darker varieties deep purple, and violet, with scales of a brilliant yellow ; iridescences of blue, red, brown, and gold occur in the lighter kind. These colours slightly fade after the ore has been broken several days.

*Structure.*—Massive and scaly, the scales possessing the form of octahedral, pentagonal, and irregularly shaped plates, the rhomboid however is the primary crystal afforded by these scales when fractured.

The scales readily separate from the matrix and are very brittle.

*Dust.*—In the lighter varieties yellowish red which stains the fingers.

Cherry red in the darker.

*Chemical analysis.*—I found this ore to be an hydrate of the peroxide of iron.

Under the blow pipe the spangles of the lighter variety of the ore, yielded after scintillation and ebullition a scale of pure iron. The darker variety, almost as soon as the reducing flame has been applied, yields a similar result.

With borax a bottle green glass is obtained which retains its color while hot, but fades entirely on cooling.

Berzelius, speaking of this phenomenon, states that it arises in the reduction of the peroxide of iron to the state of the protoxide. With soda the ore gives a red bead.

*Lustre.*—Some of the scales possess the lustre of the adamant when the light falls upon them.

Nearly all reflect objects passing in front.

In the middle of some of the blocks nodules of the same ore occur in a decomposing state.

In the lighter variety almandines of inconsiderable dimensions are occasionally embedded.

*Pisiform iron ore* is found in many of the banks about the Cantonment, under the vegetable soil, in rounded grains from the size of a pea to a pin's head,

This mineral is an oxide of iron. Yields water in the mattrass. Its dust is taken up by the magnet.

Structure amorphous though some of the grains peel in concentric coats.

This ore is distinct from the radiated pea iron ore, which the roads are made of at Madras, and which I believe is called laterite, a vague term, not found in any works on mineralogy, and made use of to denote any outlying iron whose mineralogical place is undetermined.

Many of the detached masses of decomposing rock into the composition of which iron largely entered are wholly encrusted with a mamillary coat of oxide of iron. The iron of the rock probably decomposing the water in the air that came in contact with its surface, separated its elements, liberating the hydrogen, and combining with the oxygen.

Amidst the heaps of red hæmatite on the side of Dodabett, I met with blocks of sand stone traversed by thread veins of iron.

This stone fractures into doubly oblique prisms, the longer side being parallel to the metallic veins. It is quite adventitious I suspect, and is a compact granite altered by the metal that has traversed it.

Iron earths of red and brown colors occur in the same locality.

The blocks of hæmatite are intersected by veins of crystalline rose, prase, yellow and amethystine quarts, embedding carbuncles. The assays of the foregoing irons are not yet completed.

A stratum of chlorite schist crops out on the surface of the Hill, where the specular and octahedral iron ores occur. It has a dip of about 45 degrees to the Northward.

On the South declivity of the hill, in a pathway leading to Dr. Wight's house, two distinct layers of it apart from each other appear which if taken as margins of the whole bed, would afford a thickness to it of about 14 feet.

It is connected with garnet rock and stratified quartz, which I believe to be distinct from the vein quartz and to belong to the quartz rock of the metamorphic series.

The chlorite schist occurs in the following forms.

1. Green chlorite schist a concretion of foliated chlorite, having a pearly lustre and a highly saponaceous feel. It is soft to the nail, and wants elasticity: the last three qualities distinguished it from mica, which has but 9 per cent of magnesia while this possesses 27.

Examined with the microscope it presents the appearance of numerous small glistening scales. It loses its color before the blow pipe and is fused with difficulty.

Some specimens emit an earthy smell when breathed upon.

2. Chlorite schist. A green slaby homogeneous base, embedding black shining scales of mica and small plates of green chlorite.

3. Quartz and chlorite alternately laminated.

4. Asbestiform chlorite schist, a base of foliated silky white chlorite including scales of mica.

The discovery of chlorite schist, argillaceous schist, hornblende schist, and of what I have every cause to believe, metamorphic quartz rock, although in inconsiderable quantities, has satisfactorily established *the presence of the metamorphic or Primary stratified Rocks on the Neilgherries.*

I am very sanguine that gneiss and true Mica slate will shortly be found.

In cavities of the outlaying quartz geodes are met with con-

taining six sided prisms of the same mineral with pyramidal terminations.

Dodabett is the highest eminence of a group of hills, the part of a chain which traversing the Neilgherries, preserves about a North East and South Westerly direction.

The longer axis of the hills comprising the group, are parallel to the direction of the chain, and these hills are connected transversely by subordinate ridges.

From Dodabett, spurs shoot out in every direction and shape, their summits, however generally maintaining a rounded form. The computed height of Dodabett is, 8,760 feet above the level of the sea, an elevation conjectured by some to be only inferior to that of the Himalayas with respect to the relative mountain altitudes of the Indian Peninsula. I cannot however concur in this view.

Standing on the summit of Dodabett, and looking to the south, I can discern a mountain range far away which seems to be at least on a level with my own position. Taking this into consideration as well as the non-existence of any material amount of refraction in the clear atmosphere prevailing in these elevated regions, I am led to conclude that the distant mountain is about as much elevated above Dodabett as its base is below a tangent set off from the earth's circumference at the point where Dodabett rises from it.

Dodabett is so thickly covered with vegetation and soils, that the geology of it is almost inaccessible, for which reason I can say little more than that a mass of garnet and granite rocks has been traversed by traps. Near the Southern extremity of Dodabett, at a remote period some convulsion separated the mountain from the chain it belongs to, and left a deep incision. Advantage has been taken of this *hiatus* in constructing the road from Coonoor to Ootacamund.

The rocks on both sides of the pass are identically the same, and the configuration of the opposite precipices confirms the fact. A list of the rocks and minerals noticed in Dodabett is subjoined.

## Rocks.

1. Large grained granite consisting of Felspar, quartz, and black mica.

2. Compact granites.

3. Decayed granite of Felspar and quartz with rifts throughout the mass which probably once contained mica.

4. A granite consisting of quartz and Felspar.

5. Garnet rock sometimes occurring in columnar masses.

6 and 7. Syenites of various hues, and green stone.

The following interesting varieties of overlying rocks occur in outlying masses near the pass above alluded to.

8. A combination of compact Felspar, quartz, white mica, and hornblende; associated with.

9. A combination of opalescent, and amethystine quartz, mica, garnets and Cinnamon stone.

10. A combination of Amethystine quartz, common quartz, pearly white Felspar, black and gold coloured mica, Cinnamon stone, and green hornblende.

The three last rocks are remarkably beautiful.

11. Common Felspar and hornblende.

## Minerals.

1. In some stratified blue quartz accompanying common garnets, occurs a garnet of remarkable and unusual form, being a six-sided prism with terminations of three sided pyramids. Notwithstanding its prismatic structure the crystal like the common garnet retains twelve rhomboids.

No molecular replacement will account for this deviation from the characteristic form of the garnet, and I can only imagine two garnets to have united. Some of the crystals of this mineral are tinged with a smoky blue colour.

2. *Idocrase* which occurs in Syenite.

3. Hypersthene occurs in the rock marked 4 in the preceding catalogue.

4. A Felspar of a deep green color, in appearance approximating to the beautiful variety called Amazon stone.

5. Blueish green Felspar with white stripes (probably cracks) presenting in one direction a highly shining pearly lustre, and occasionally opalescent like Labrador.

6. Calcedony of white, yellow, green and blue colors ; stalactitic, dendritic, botryoidal, and massive in shape, lining the geodes of cellular ferruginous quartz ; accompanying.

7. Hyalite investing the sides of an empty geode.

8. In the same quartz, lining geodes occur microscopical and very brilliant prismatic crystals of some ore of iron, but so small as to baffle analysis, probably limonite.

9. Red iron ore,—a mineral extensively diffused in the neighbourhood of Ootacamund and upon Dodabett, occurs in every stage of decay downwards to a red iron earth.

In one stage of this progress it presents the appearance of common red brick.

I shall take some pains to describe this mineral upon which the appellation of laterite has been also bestowed.

It is of a red brick color, full of small cavities which probably once held scales of oxide of iron. Is brittle. Is a combination of silica, water and iron; the iron being a peroxide occasionally blended with protoxide when the stone becomes magnetic.

In some specimens metallic grains may be distinctly seen with the lens. Before the blow-pipe after roasting, the result is taken up by the magnet ; with borax gives the fading green color which denotes peroxide of iron. In the bulb tube disengages water. Upwards this ore may be traced through different specimens to the scaly oxide of iron lamellated with quartz.

The iron ore of these Hills occurs in various curiously shaped forms, viz.

Tubular, botroyoidal, mammillary, cavernous, in veins traversing quartz which it alters to sandstone, in hollow balls, &c.

10. Pisiform iron conglomerate an aggregation of the pea iron ore described before, and which I should have mentioned contains

so much iron that several of the peas will attach to each other in a string depending from the magnet.

11. Red iron glance in pyramidal concretions.

12. Variety of reddle resembling rouge (undescribed.) Has a red streak and reddens paper like red chalk. Is very soft and easily shaped by the knife. Structure lamellar, and easily separated into thin plates. Lustre shining. Becomes black and metallic after roasting when it is taken up by the magnet. Is a combination of iron, oxygen, water-silica, and alumina.

13. Sulphuret of iron three varieties.

Var. 1st. Color different shades of grey. Dull, but fractured surfaces present a white metallic lustre.

In the matrass gives off fumes which possess the odour of sulphur, and sublime on the neck of the tube. The result after roasting is raised by the magnet. Somewhat resembles white pyrites. Occurs in a rock of green syenite accompanied by the following—

Var. 2nd. Externally resembles sulphur; of a yellow color, very brittle. When rubbed between the fingers leaves a sulphurous smell. Roasted it evolves sulphur and leaves a metallic scoria acted on by the magnet.

Var. 3rd. Investing the foregoing which it resembles in every respect except color which is a greenish brown. After very careful examination I could detect no arsenic in any of the foregoing sulphurets.

14. A green iron ore of which I can find no description in the works of the English and German mineralogists. It bears a considerable affinity to those varieties of talc described by Gruner and Vauq as containing 25 per cent. of oxide of iron. Has a shining pearly lustre. Color a beautiful apple green changing according to the position the mineral is held in. Structure micaceous. Occurs in flat hexagonal prisms, the angles of which are obliterated and amorphous. Is soft and unctuous. No action takes place in muriatic acid, though a feeble effervesence is perceptible when the mineral in powder is immersed in sulphuric acid. Gives of water in the bulb tube. After submission to the reducing flame

for a considerable time the result is acted on by the magnet. Tinges borax the color indicative of iron. This mineral occurs with the variety of reddle, in a rock consisting of green felspar, and blue quartz.

In the course of a ride to Coonoor I had an opportunity of adding another to the list of geological causes that, degrading mountains and filling up valleys, have contributed so largely to alter the conformation of the face of our planet. The discovery likewise enabled me to account for the singularly polished and smoothed surfaces of some of the hills, and eminences I have seen in different parts of India, which had hitherto baffled my penetration. On the side of one of the branches of Dodabett I observed a bluff scarp of rock which projected out of the side of a hill presenting a smooth dark coloured surface suggesting the idea of a slice having been recently cut off it perpendicularly. Proceeding to discover if possible the cause of this phenomenon, I found the whole upright *facade* or face of the rock, some feet in thickness, and many yards high, had actually separated itself from the mass, and in sliding downwards left a bare smooth surface behind it. This *facade* preserving its original contour now rested at an angle against the base of the mass from which it had slid. It was this circumstance that enabled me to arrive at a proper conclusion.

I consider myself fortunate in having made the discovery, apprehending that in most cases the *facade* from its high fall is dashed to pieces on reaching the base of the rock where it lies in a heap of stoney ruins. Water percolating through the pores of the rock, destroying the adherence of the *facade* to the mass, has probably been the agent which achieved the dilapidation.

I can conceive the water to have percolated through upright fissures seated horizontally beside each other—fissures the element may have worn for itself, or it may have disintegrated a stratum of some inconsiderably adhesive mineral connecting the *facade* with the parent mass.

Very few rocks or minerals of interest are met with between Coonoor and Ootacamund, green syenite being the prevailing formation. About a mile however from the bungalow of the former place I found the subjoined minerals.

*Black Manganese ore*, combination of manganese, oxygen, water, silica, and iron. Magnetic after roasting. With borax gives a violet bead. In the bulb disengages water. Massive and botryoidal. Leaves a shining streak on paper. Is scratched by the knife and leaves a shining streak under it. Colour—blueish black, opaque. Fracture earthy. *Berthier* states this ore contains 70 per cent. of manganese ; all the ores of this metal afford from 65 to 85 per cent. with the exception of the silicate of manganese which has but 50. When the manganese ore found at Coonoor is dissolved in muriatic acid, and exposed to heat, copious fumes of chlorine are evolved. I failed to obtain a precipitate of sulphate of barytes from the solution, on testing with sulphuric acid, although barytes is usually found in combination with this form of manganese. Accompanying this ore I found that beautiful variety of brown iron ore called, brown hematite, fibrous brown iron ore. *Color*—blackish brown. *Structure*—fibrous and radiating. *Lustre* silky, botryoidal, mammillary, stalactitic. Iridiscences occur in some of the specimens. Brittle.

While speaking of brown iron ore I make the opportunity subserve to describe two varieties I observed near Ootacamund. Stalacmitic brown iron ore (hydrate of iron) arises in a deposit from water strongly impregnated with iron, and is probably the same with the *morasterz* of the Germans though more indurate. Occurs in stalacmitic beds 2-10 of an inch thick in banks below the vegetable soil. To the lower side of these plates, when they are drawn out of the bank, are found small stalactites depending.

This ore is a hydrate of iron with a considerable quantity of allumina and silica. Is raised by the magnet after roasting. Stalactitic brown iron ore (hydrate of iron), about which DeBenza spent so much time and thought in endeavouring to account for its tubular form conceiving the tubes owed their origin to capillary attraction, in other words making the stalactites grow upwards instead of downwards. The stalactite is formed by the percolation of water containing iron. It has long been known as one of the commonest forms of this ore. This mineral is raised by the magnet after roasting.

Jaspery iron—a variety of red iron ore I also now add to the list of the ores of iron.

Garnet rock and compact red granite again occur near Coonoor; indeed I conjecture that the former rock extends down the Ghauts as far as Cape Comorin, for I observed some years ago that a part of the beach, at that Cape, consisted of very minute garnets arising probably from the disintegration of garnet rock.

Between Coonoor and a ridge emanating from Dodabett, six miles to the north of that place, the conglomerate which I observed accompanying the garnet conglomerate in the garnet valley, is distributed over the face of the country along with red iron ore, and a highly ferraginous conglomerate. The ridge itself is composed of syenite; garnet rock, and eurite, (quartz and felspar.)

Since this paper was first written Dr. Burrell found galena and sulphuret of copper, near Ootakamund, and I discovered silicate of zinc in the same locality.

H. C.

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## *An outline of the Geological History of the Neilgherry Hills.* By Major H. Congreve.

In the *molluscs* and *zoophytes* of the Cambrian system, and the corals, *crinoidea*, *crustacea*, *conchifera*, and the *coprolites* or fossil excrement of fishes in the silurian; the two great divisions of the *grauwacke* formation; the clearest testimony is afforded, that a vast ocean rolled its waters over the *metamorphic* rocks immediately beneath this group. The rocks of the metamorphic series, gneiss and hornblende schist chiefly, formed the bottom of this ocean they having been originally granite and syenite, subsequently metamorphosed by pressure and the mechanical and dynamical action of molten-trap rapidly and continuously over them.

The metamorphic rocks have been found in all quarters of the globe, and appear as surface rocks in most countries; but this is not the case with the grauwacke group. And this can only be accounted for by conceiving that, in places where rocks of this series are wanting, the waters of the grauwacke ocean were so turbulent and disturbed as not to admit of any deposit; the materials

suspended in the element being washed from such sites into more tranquil ones, into basins and hollows in the bottom of the deep, where they have since been covered in by after deposits. Thousands of years hence, when nature through the agency of time, attraction, fire, and water, shall have made the bed of the existing sea dry land, and our Continent the ocean's bed, the missing geological groups may appear with their organic remains of shell-fish, corals, zoophytes, vegetables, and the earliest specimens of organic life, in the same manner as the secondary strata are in our day being discovered in basins and small patches.

At a very remote period in the geological history of our planet, the sea, of which the metamorphic rocks were the bottom, washed over that part of the Indian peninsula where the Neilgherries now stand—at that time not elevated. While the first rudiments of organic life were starting into being in that ocean, some internal convulsion took place, upheaving the mass of syenite forming the main rock of the Neilgherries, and forcing it through the gneiss and hornblende schist at the bottom of the sea; portions of which rocks were simultaneously raised, some to the surface of the plateau, and others upon the flanks, which positions they tenant to this day. The strata of metamorphic rocks round the foot of the Neilgherries are found to dip from the Hills: in other words they were violently disrupted from their horizontal position by the invading mass, forced upwards, and their elevated ends left leaning on the lower sides of the Hills.

The entire absence of the rocks of the grauwacke group on the Neilgherry Hills, while those of the preceding series exist, indicates the elevation of the plateau to have taken place at the time the grauwacke ocean had barely commenced making its deposits. Concealed at present by the vast forests that fringe the foot of the mountain, horizontal strata of the grauwacke rocks may hereafter be discovered reposing on the lower slopes and the inclined metamorphic rocks. But in case they are never found, we shall be compelled to account for their absence in the manner before mentioned.

In its passage through the grauwacke ocean, the ascending

mass of syenite of the Neilgherries carried upwards with it a large body of water, that had a considerable influence in conveying certain existing features to the configuration of the Neilgherries, which I shall presently consider.

The motion of the ascending syenite may have been oscillatory: vast masses rose from the interior of the planet and almost as soon descended ; in some instances the foundering of these masses took place at their centres, and left basins and funnels. The better to understand this, I request the reader to turn over an hour-glass, and mark the descent of the sand in the shape of a funnel : he will then see in the subsidence of the inside of the incoherent mass, as the sand descends, a partial illustration of my meaning. This oscillatory action did not cease in the syenite until the whole moving mass was completely fixed. Much of the water poured downwards through the funnels. Other volumes of it rolled off the plateau into the ocean below, creating in their descent those deep grooves in the mass, met with on every side of it, and of which the Guzlutty, Segoor, and Coonoor Ghauts, form the most conspicuous examples : their cliffs, many hundred feet in height, and the general extent of these vast chasms, at once dismiss the idea of their excavation being due to the erosive action of the insignificant streams that flow along their bottoms. If a circular piece of paper be drawn with rapidity upwards through a basin of water, its sides will be bent and grooved downwards, affording an illustration of the process by which the deep fissures in the sides of the Neilgherries were originally formed.

The waters having subsided into the depths of the earth, below the plateau, and into the sea surrounding it, left a mass of syenite, which would have presented the appearance of numerous peaks and ridges surrounding hollows and funnels : many of the former may yet be seen, while the latter have been since filled up by invasions of other rocks from below.

Posterior to these events another series of rocks were erupted, of a different character to the preceding, being granite chiefly pegmatite, but rarely that composed of the three minerals, quartz, felspar, and mica ; the felspar in some cases being compact, and

garnets diffused extensively These granites were projected up the funnels in the syenite, and filled the basins above.

And thus we might account for the occurrence of the syenite in the positions denoted in figure 1st, a—a being syenite, and b—b granite. Pegmatite is found constantly on the Neilgherries capping syenite hills as here represented.

I now arrive at that period in the geological history of these hills, marked by the projection of the trap-rocks. These were injected by subterranean forces into the cracks and fissures that water, converted into steam by the subjacent heat, had created in the rocks in its efforts to find vent. Some of the fissures however were not filled, and may still be seen empty.

First, amongst the trap-rocks or overlying, I class the red iron ore, carelessly designated laterite by some of our geologists, and which I have ascertained to be a combination of silica, alumina, water, and peroxide of iron. This rock is most extensively disseminated on these hills, appearing in overlying masses capping the highest peaks in dykes traversing their sides in veins that have overflowed their elevated vents and escaped down the sides of the hills, and in low rounded hills, all the result of a discharge from below.

Iron enters largely into the composition of the other trap-rocks of the Neilgherries, and it is worthy of observation that in the three great epochs of this history it is found extensively prevailing. In the first period, when the syenite was elevated, iron is found disseminated throughout the different varieties of this rock, combining with silica, magnesia, lime and alumina, to form the hornblende of it. In the second period, at the time of the projection of the granites, we find it in connexion with other minerals entering into the composition of the garnet family, abundant on these hills: cinnamon stone, idocrase, almandine and common garnets, being very frequent. In the trap epoch, iron appears as the red iron ore, a decided trap-rock, and it occurs under different forms as veins traversing the whole series. For a more detailed account of the mineral forms of this metal, I refer the reader to my " additions to the mineralogy and geology of the Neilgherries."

This constant appearance of the iron whenever a mineral mass has been projected from below, renders it probable that vast quantities of the metal in a molten state lie beneath these hills in subterranean depths, in which laboratories of nature, her hand forms the mineral combinations that are subsequently cast upon the surface.

This point terminates the history of the elevating causes that have produced the plateau known as the Neilgherry Hills.

I shall next consider those which are now operating conversely to reduce these mountains again to their ancient level, and eventually many thousand years hence to blot them out wholly from the map of the earth's crust; carrying their debris far away as the materials for new Continents. Already had the destructive agent, water, commenced its operations, when the creative principle fire was forming the Hills. We have learnt that the *waters* raised by the *fire*, at their recedence, grooved out of the earthy-mass ducts for their own descent, and it is believed that the meeting of these antagonist *elements*, when the waters in part descended through the funnels and fissures in the syenite upon the fires below, led to the partial dissipation of both, and from their destruction arose a third power probably as great as either in producing geological events, viz.

Steam.—The effects of this new agent to expand and release itself from the narrow limits it was confined in, produced many of the rents and crevices, in the plateau, subsequently filled by metals and minerals; while it also shattered the base of the rocky buttresses to an extent, in many cases, adequate to produce such effects as we find below the Khoondah mountains, where vast heaps of peaks lie in the subjacent valley, these peaks having been the summits of the mountains whose bases fell by the explosive action of steam.

More recent deluges excavated during their recedence, the numerous vallies now furrowing the surface of the Hills, and the streams flowing along their channels afterwards contributed to wear away the soil, assisted by heavy rains that washed into their beds portions of the banks of the adjacent eminences. As the

valley streams progress towards their confluences, large rivers in the low country, the constant action of the running waters undermines the rocky sides of their channels, and the banks in the sequel give way and fall into the current. The comminuted debris of the syenite rocks of the Neilgherries, in the shape of sand carried into the ocean, bears along with it bones and remains of animals now existing, both terrestrial and fluvial ; and in after ages some future geologist will perhaps examine petrified fishes, and other marine animals, along with fresh water shells, vegetables, and perhaps the remains of his fellow-man, in an indurated sand-stone formation, now in progress at the bottom of the ocean, which once composed the materials of the Neilgherry Hills : that is, supposing the ocean bed shall have been upheaved while the present continents subsided, in completion of another of those oscillatory movements that have wrought so many changes in the face of our planet, but on a scale of greater magnitude, and in a space of longer duration than that I have previously alluded to.

The last deluge that visited the Neilgherries has left behind it a thin stratum of gravel, now occupying a position between the vegetable soil and the surface of the clay below it. This gravel has been confounded by some with the decomposing surface of the older rocks. The same flood likewise excavated in the action of its eddies, many of those hollows seen in the sides of the Hills.

Subterranean springs undermining superstrata, have produced instances of the geological phenomena known as "Landslips," the most conspicuous being the well known avalanche. The same element has contributed to wear down precipices by removing the entire façade, which in its descent has highly polished the parent mass behind it. In one instance I have observed the façade leaning against the base of the rock from the face of which it has slid.

Atmospheric agency has largely contributed to wear down the surface of the Neilgherries. The shape of many of the low rounded hills is referable to it, the syenite having exfoliated in concentric layers from their summits. In the course of my examinations of the effects of decomposition upon rocks in this locality, I

have at first mistaken concave masses in the neighbourhood of larger rocks for separate pieces, but on proceeding to excavate the soil, have discovered them to be merely the concentric coatings of the mass, joined to it below.

The depth to which decomposition has extended is very considerable; in many cases whole hills have been converted from rock into an earthy soil, in which beds of porcelain-clay are frequently met.

There are many other agents at work in degrading the surface such as roots striking into the fissures of rocks, &c. not necessary to mention, because their operations are well known and every where met with. I have enumerated those which I considered of the greatest importance, and have now mentioned, I believe, most of the leading features which would enter into a geological history of the Neilgherries, condensing the subject as much as possible for the readers and for my own sake.

In a more complete account of these Hills, the minor geological details of districts and their mineralogical characters, would be inserted between the different heads. The observations of Dr. DeBenza, and my own papers entitled " Contributions to Indian Geology and Mineralogy," would furnish such particular accounts. The foregoing history of causes that have produced existing effects, is for the most part inductive, being the result of nearly a year's careful study of the prevailing geological state of the Neilgherries.

## XVII.—*Narrikal or Cochin Mud Bank.* By FRANCIS DAY, *Civil Surgeon, Cochin.*

In the last number of the *Madras Quarterly Medical Journal*, page 202, will be found a short notice of a *re-discovery* of a Mud Bank, extending to Narrikal, about six miles north of Cochin. This bank, so close to the shore, so extraordinary, and which might eventually become most useful, appears to have been mysteriously lost sight of by the European residents of the port, and even by practical seamen. It is proposed to trace its history, from the present time backwards to about 84 years ago, when the Dutch were masters of Cochin. If this paper serves no other purpose, it may be instructive, as showing how easily recorded facts are forgotten in India.

The re-discovery of this bank,* dates from May 22nd 1861, when the vessel *John Cobbold*, anchored there : less than three and a half years previously, its existence was observed upon in the small local Journal, in a letter dated February 13th, 1858, in which, it was stated " the shore from thence (Malliapooram) to Palliport, " is protected by a mud bank."

In Lieutenant Selby's elaborate Chart of the Western Coast, dated 1854, it is traced out, as extending from the mouth of the Cranganoor or Aycotta river, to Narrikal. In 1841 it was remarked upon by several Europeans. In *Horsburgh's* East Indian Directory, fifth Edition, 1841, page 512, it is stated under the head of Cranganore Fort :—" From the south point (of the Aycotta or " Cranganoor river) a mud bank with 3 fathoms on it, projects " out near two miles to seaward."

Lieutenant Arthur in 1810 (Records of Travancore 1839) says, " a ledge of rocks is stated,† to strike out from the Coast, for " some distance in the vicinity of Pallypuram (Palliport), A mud " bank lying about 3 miles out at sea parallel to the shore, and

* See report of the Master Attendant of Cochin dated July 6th, 1861, which enumerates its nautical advantages, and describes its position, &c.

† His report appears an incorrect translation of that of *Stavorinus*.

" stretching formerly from beyond Allepey, to Porracaad (Porca), " formed a good anchorage where ships in twenty fathoms (feet?) " water, rode secure in all seasons, from the dangers of a sea (lee ?) " shore."

Lieutenant Arthur's account is no doubt vague, but on examining it by the translation of the voyages of the celebrated Dutch Navigator Stavorinus it becomes apparent, that he had quoted incorrectly, unaware that two mud banks existed south of Cochin and one to the north.

Stavorinus in 1777 stated the " Coast is safe and clear every- " where along the Company's establishment, except at the mouth " of the river of Cranganore where there is a reef, at the north " side, which stretches out to sea, about three-quarters of a " league ; it is called the reef of Aycotia by our Navigators : be- " fore Coylang (Quilon) there is a similar one but which does not " extend half so far out. South of the abovementioned mouth of " the river of Cranganore, there is a bay, formed by mud banks ; " likewise one not far from Porca, and another south of Cochin ; " the banks forming which extend full a league out to sea, and " into which vessels may run with safety during the bad monsoon, " and may lie in twenty, and less feet water, almost without an- " chors or cables, in perfect security against the heavy seas, which " then roll in upon this lee-shore, as they break their force upon " the soft mud banks, and within them nothing but a slight mo- " tion is perceived."

From the foregoing it appears that a bay protected by mud banks existed between the mouth of the Cranganoor river towards Cochin in 1777 and then appears to have been well known. At present, the same protected spot exists, but it is no longer a bay, and for the following reason. Though the northern projection of the coast at the mouth of the Cranganoor river, forming the northern extremity of the " mud bay" is still present; the southern projection, or that between Narrikal and the mouth of the Cochin river, is gone, having in fact been covered by the sea: (at this place a church stood, which is now submerged) had it not been so, a " *mud bay*" would still be present. It is curious that this law of encroachments of the sea is now the rule on the Western Coast,

because tradition* and an examination of the geology of the country, both lead to the conclusion, that the sea formerly washed up to the Western Ghauts; thus Malabar has been literally raised from the sea.

During the south west monsoon, the rivers on the Western Coast swell to a great extent, and become loaded with alluvial deposits. Should any obstruction occur at their outlets, deposits sometimes take place, as at the Cranganoor and Quilon rivers, where mud banks have been so formed. Whether the impediment to the alluvial deposit being carried out to sea, is merely owing to the action of the S. W. monsoon causing a great impetus to the waves as they meet the river at its exit: or whether other causes also obtain, may be questioned. In forming the Narrikal mud bank, a reef of rocks, the Aycotia reef, at the mouth of the Cranganoor river, appears to have prevented the S. W. monsoon from causing a divergence of the river's mouth to the northward, (as invariably takes place on the Western Coast unless that bank is protected)† this reef (Aycotia) has probably assisted in the formation of the Narrikal, or more properly speaking the Cranganoor mud banks.

The whole of the long islands, between the backwater and the sea, are evidently merely alluvial deposits, brought down by the, various rivers, in their course from the Western Ghauts.‡ The direction of these mud banks being the same as the long islands and the character of the soil being similar, demonstrates the causes of their origin to be probably identical. In short the mud banks are alluvial matter, brought down by the rivers and deposited in the sea where it meets the force of the S. W. monsoon.§

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* "In a M. S. S. account of Malabar" says *Hernan Lopez de Castaneda* in 1525 it is said that little more than 2,300 years ago "the sea came up to the foot of the Western Ghauts."

† See *Taylor's* report.

‡ See *Sir Emerson Tennent* on Ceylon.

§ During the S. W. monsoon, the sea for several miles beyond the entrance of the larger rivers is no longer salt.

Though *Narrikal* owing to its being the nearest place to Cochin is mentioned, the density of the water is greater proceeding towards the Cranganoor river. It becomes very thick and black, and large pieces of flat hard mud begin to be perceived lying on the shore, about one mile north of Narrikal, having been thrown up by the sea. Passing on towards Cranganoor, a large bank of the same substance exists, evidently brought down by the river, and this is one source, from which the mud bay receives a fresh supply.

Every little stream, and every little gully, is an excellent miniature representation, of the larger rivers, bringing down alluvial matter. On making sections of the sand, every 200 yards, northward of Narrikal, the same appearances were presented, layers of sand, alternating with layers of alluvial deposit. The larger the stream, the thicker the various layers. No gases arise from the water, nor oily substance (as has been suggested) floats upon it It is simply the action of the sea which prevents the subsidence of the mud, for as soon as placed in a still vessel, it sinks. The shore is sandy, but amongst the sand alluvial deposit exists. The smoothness of the sea is well described by Stavorinus.

It is stated by the fishermen that this part of the coast is very well stocked by the finny tribes, probably owing to the amount of mud, as well as to its sheltered position. It is remarkable to perceive fish of the family *Clupeidæ* of from one to two ounces in weight, jumping out of the water in all directions, on being disturbed by the paddles of the fishermen's boats, whilst Brahminee kites in considerable numbers circle about, watching for or sweeping down on the fish for their prey.

Small specimens of sea snakes, *Hydrophidæ*, are not uncommon, they are reported not to be venomous. On the sea shore at almost every step little light coloured and active tiger beetles *Cicindelidæ* are perceived jumping about. The mud has an unctuous sticky feeling, and is not gritty unless mixed with sand. It is of a very dark greenish colour, has but a slight odour, and subsides in water.,

Cochin, *5th September* 1861.

*The Mud Bank at Narrikal, near Cochin ; its composition, as exhibited by the Microscope.* By LIEUT. J. MITCHELL.

In the month of September last a small quantity, about half a cubic inch, of a dark brown earth was sent to me for examination with the microscope. It was said to be a portion of the great Mud Bank at Narrikal on the Western Coast, the existence of which had lately been brought to the notice of Government by Captain John Castor, Master Attendant at Cochin, and of which a notice appeared in the Madras *Times* of the 13th August, 1861.

As this report may have escaped the notice of some of the readers of the *Madras Journal of Literature and Science*, I may say, briefly, that Captain Castor reports the existence of an extensive mud flat, which, commencing about half a mile south of the village of Narrikal extends to the north for about four miles. Within this space, in the height of the S. W. Monsoon, he found the sea without a ripple ! But the greatest stillness of the sea, and the total absence of surf from the beach prevailed between a village named Nairambolum and Narrikal, a distance of about one and a half miles :—at this point Captain Castor was always able to embark from the beach in a small canoe.

The mud appeared to be exceedingly soft and permitted a 7 lb. lead to penetrate it to the depth of three feet in some parts where there was a super-stratum of from six to ten feet of water, and a bamboo penetrated six feet where there was a depth of six feet of water. Beyond the depth of sixteen feet, the bottom attains greater consistence and appears good holding ground. Three miles and a half from the shore the depth was five and a half fathoms and gradually shoaled towards the shore. We are left to conclude that the bank extends to that distance from the shore, but this is not distinctly stated in the published account.

The small quantity sent to me was damp, and appeared very firm and tenacious ; it had however been somewhat compressed by the waterproof wrapper in which it was packed. To ascertain if it contained any minute shells a portion was placed in water, but it did not break up readily, and as I wished to avoid any vio-

lence that would destroy such delicate structures, I allowed it to soak for twenty-four hours. On shaking it up at the expiration of that time I found that at least half of it could not be separated in that way. I therefore pressed it gently with a glass rod ; it resisted the pressure, much in the way that a stiff piece of jelly would do, exhibiting considerable elasticity as well as tenacity, and it is doubtless these properties that enable it to break the force of the waves :—acting like an immense spring, it yields to their pressure, but in the encounter the water loses its force and becomes quiescent, while the mud gently expanding again is ready for a fresh encounter.

When by a good deal of gentle coaxing, it was diffused in the water, it was stirred well in about five inches of water and allowed to stand for half a minute, when all but the last half inch was poured into another beaker and time allowed for both to subside.

The first vessel produced some Foraminifera which I refer to the Genus Rotalina, (D'Orbigny) but doubtfully, as no monograph of the Foraminifera is at present accessible and other works in my possession do not give sufficient information to enable me to speak positively. Besides the Foraminifera there were one or two small pieces of larger shells and some very small angular fragments of quartz.

As much of the water as could be was poured from the second vessel and replaced by strong muriatic acid ; this was kept boiling for about three hours, when, after having been allowed to settle, the acid was poured off and an equal quantity of nitric acid added which was kept boiling for about the same time. But as this did not appear to have entirely destroyed the organic matter the deposit was further boiled for four hours in strong sulphuric acid, after which it was washed in several changes of distilled water. There remained, in about equal proportions, Diatomaceæ and some amorphous matter which having resisted all the boiling in acids is probably siliceous.

The following is a list of the Diatomaceæ found in this deposit ;—they are arranged in the order observed in the last Edition of Pritchard's Infusoria, which contains the most complete

description of these minute organisms that has been yet published.

## CLASS CRYPTOGAMIA.

### SUB GROUP DIATOMEÆ OR DIATOMACEÆ.

### FAMILY I.—EUNOTIÆ.

Genus EPITHEMIA (Kutz.)
Epithemia argus (Ehr. Kutz.)
Genus EUNOTIA, (Ehr.)
Eunotia diadema (Ehr.)
Genus HIMANTIDIUM (Ehr.)
Himantidium undulatum (Sm.)

### FAMILY IV.—FRAGILARIEÆ

Genus NITZSCHIA (Hass, Sm.)
Nitzschia sigmoidea (Nitzsch. Sm.)
N.——— sigma (Kutz, Sm.)
N.——— lanceolata (Sm.)

### FAMILY V.—SURIRELLEÆ.

Genus SYNEDRA (Ehr.)
Synedra (? Sp.)
Genus TRYBLIONELLA (Sm.)
Tryblionella (? Sp.)
Genus. SURIRELLA (Turp. E. S.)
Surirella fastuosa (Ehr.)
Genus CAMPYLODISCUS (Ehr. Men)
Campylodiscus splendida (N. S.)

### FAMILY VI.—STRIATELLEÆ.

Genus TABELLARIA (Ehr.)
Tabellaria fenestrata (Lyng. Kutz.)
Genus GRAMMATOPHORA (Ehr.)
Grammatophora marina (Lyng. Kutz.)

### FAMILY VII.—MELOSIREÆ.

Genus CYCLOTELLA (Kutz.)
Cyclotella astræa (Ehr. Kutz.)
C.——— (? Sp.)
Genus MELOSIREÆ (Ag.)
Melosira marina ? (Orthosira marina. Sm. ?)

## FAMILY VIII.—COSCINODISCEÆ.

Genus COSCINODISCUS (Ehr.)

Coscinodiscus centralis (Ehr.)

Coscinodiscus Oculus Irides (Ehr.)

C. pectinalis. (N. S.) Disk with irregularly radiating cellules, smallest near the margin; a hyaline border divided into numerous compartments by radiating points. Diamr. 1.625."

C. ———— (? S.) Disk with a central umbilicus of seven elongated cells; cells near the centre and margin smallest. In a dry valve the angles of the hexagonal cells appear punctated at the upper focus. Diamr. 1.500."

C. ———— (? Sp.) Disk with a sub-hexagonal hyaline umbilicus having in the centre about 15 scattered punctæ. Disk divided into numerous zones by punctated lines radiating from the umbilicus; compartments containing 7 rows of parallel punctæ of which the median alone reaches the centre, margin broad, very finely striated. Diamr. about 1.250". This is a very fine diatom, but the specimen observed was broken, so that I am not quite certain about the diameter.

C. ———— (? S.) Disk with smooth hyaline, umbilicus, cells in radiating rows of which some do not reach the centre, marginal cells small, irregular, the cells from the centre half way to the circumference gradually increase in size and have thick walls and an irregular outline, the remainder are large, sharply defined, hexagons. Diamr. 1.300".

Coscinodiscus (? S. or ?) Disk divided into eleven compartments by parallel rows of hexagonal cells of which the median one alone is radial and reaches the centre of the disk, viewed transversely the compartments have the oblique striation of Pleurosigma, margin plain. Eleven short processes with expanded and depressed extremities appear to be attached to the interior of the connecting ring and opposite the centre of each compartment Diamr. 1.375".

Coscinodiscus (? S.) (or ?) Disk divided into 9 triangular zones of parallel cells of which the median rows only reach the centre, zones form a nonagon, of which the angles do not reach the

circumference of the disk, margin broad and finely striated, internal processes like the last but placed at the *angles* of the polygon instead of the centre of its sides, Diamr. 1.466''·*

Genus HALIONYX (Ehr.)

Halionyx nonarius. N. S. (J. M.)

Disk divided into nine compartments or zones by radiating cellular lines, not equidistant, zones formed of parallel rows of cells of which the median alone reaches the centre, a raised border or rim, marked with delicate, radiating moniliform striæ which are continued some distance inside the margin: their internal boundary not being very distinctly defined. Diamr. 1·600."

Genus ACTINOCYCLUS (Ehr.)

Actinocylus moniliformis (Archer.)

Genus ASTEROMPHALUS (Ehr.)

Asteromphalus flabellatus ? (Breb., Grev.)

Genus ACTINOPTYCHUS (Ehr.)

Actinoptychus undulatus, (Kutz.)

A. ——— quaternarius (Ehr.)

### FAMILY X.—BIDDULPHIEÆ.

Genus BIDDULPHIA (Gray.)

Biddulphia Baylii (W. Sm.)

Genus ZYGOCEROS (Ehr.)

Zygoceros rhombus (Ehr.)

### FAMILY XI.—ANGULIFEREÆ.

Genus TRICERATIUM (Ehr.)

Triceratium favus, (Ehr.)

### FAMILY XIII.—CHÆTOCEREÆ.

Genus, BACTERIASTRUM (Shadbolt.)

Bacteriastrum nodulosum (Shadb.)

### FAMILY XIV.—COCCONEIDEÆ.

Genus COCCONEIS, (Ehr.)

Cocconeis crebrestriata (Grev.)

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* NOTE.—I have left the last 6 species in this Genus for the present, but it is doubtful if they can all be retained there. The two last should probably be included in the next Genus.

## FAMILY XVI.—CYMBELLEÆ.

Genus CYMBELLA (Ag. Kutz.)

Cymbella Ehrenberghii, (Kutz.)

C. —— maxima (Nag,)

Genus AMPHORA (Ehr.)

Amphora costata, (Sm.)

A· —— spectabilis (Greg.)

Genus GOMPHONEMA (Ag.)

Gomphonema (? Sp.) I cannot identify this with any described species, but as I have not seen a front view I leave it unnamed. It is very like some Naviculeæ, but as the two halves of the valve differ in form it is undoubtedly a Gomphonema. Its moniliform striation is beautifully distinct.

## FAMILY XVIII.—NAVICULEÆ.

Genus NAVICULA. (Bory, Rab.)

Navicula didyma (Ehr. Kutz.)

N—— Hennedyi (Sm.)

N—— birostrata (Greg.)

N—— rhombica (Ehr.)

N—— formosa (Greg.)

N—— distans (Sm.) Pinnularia distans. S. B. D. 1. P, 56. P. 18.169.

N—— elliptica (Kutz.)

N—— patula (Sm.)

N—— rectangula'a (Greg.)

N—— firma. (Kutz.)

N—— cyprinis

N—— Castorii. N. S. (J. M.) valve broadly elliptic with sub-acute extremities, twice as long as broad, striæ, moniliform, parallel, 23 in. 1.1000", not quite reaching the median line; a small smooth transverse median fascia;—median line somewhat curved near the extremities, length 1.370".

I have dedicated this fine spices to Captain Castor the Master Attendant at Cochin, to whom we are indebted for the knowledge of this extensive deposit.

N—— (? Sp.) Valve rhomboido—lanceolate, with a scarcely perceptible contraction near the broad rounded extremities. Striæ

moniliform, not quite reaching the median line, a smooth median fascia continued into the marginal striæ by four unequal wedge shaped spaces, two on each side, striæ 21 in. 1.1000."

Navicula——(? Sp.)

Broadly lanceolate, the extremities gradually contracted into somewhat obtuse beaks, longitudinal striæ strongly marked, 28 to 1.1000," Transverse striæ rather obscure, requiring oblique illumination, 32 to 1.1000"—length 1.120." This may be N. Indica but the description* is too meagre for identification.

Genus STAURONEIS (Ehr. K.)

Stauroneis aspera (Ehr. Kutz.)

S———— (? Sp.) small, acutely rhomboidal, stauros narrow, reaching the margin, striæ inconspicuous. Length 1.390."

Genus PLEUROSIGMA (Smith. Gyrosigma, Hassall.)

Pleurosigma Æstuarii ? (Breb. Sm.)

P———— balticum (Ehr. Sm.)

P———— intermedium ? (Sm.

P———— strigilis ? (Sm.)

P———— inflatum (Shadbolt.)

## FAMILY XIX.—ACTINISCEÆ.

Genus DICTYOCHA (Ehr.)

Dictyocha Epiodon (Ehr.)

Genus MESOCENA, (Ehr.)

Mesocena octogona (Ehr.)

M——— binonaria (Ehr.)

The foregoing list contains in all sixty-two species, belonging to thirty Genera ; some of those I have described are probably new to Science, but in the absence of authenticated specimens or even drawings of, nearly all, the species foreign to Great Britain, I have considered it prudent to leave them unnamed, and whenever I have had any doubt of the identy of a species I have signified it by adding a note of interrogation.

It is probable that when I have had time to examime the larger supply lately received, and for which I am indebted to the kindness of Captain Castor, that the number of sp ecies will be at least

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* NOTE.—Of that species in Pritchard's Infusoria.

doubled, for the Narrikal Mud-Bank is undoubtedly a rich Diatomaceaus deposit and will well reward any one who has sufficient leisure to examine it thoroughly.

I said in the commencement of this paper that the earth had a dark brown colour, but that received since, and which is quite wet has a somewhat greenish tinge, the colour in fact depends upon the quantity of water present. Some that I exposed for several days to the sun became almost white, but I have not ascertained to what this colour is due for it was unfortunately caught in a shower, and the process of drying has to be repeated when the weather permits.

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## XVIII.—*Schriften der Königlichen Physikalish-Oekonomischen Gesellschaft Zu Königsberg*, Nos. I and II.

We have to acknowledge with thanks the first two numbers of the Journal of the Royal Physical and Economic Society of East Prussia, established in the ancient city of Königsberg, which has so lately attracted visitors from all parts of Europe to witness the Coronation of King William the 1st.

This Society had its origin in the year 1789 in the proposal of two Government officials in East Prussia to form an Association for the improvement of Agriculture: the idea was caught up, and the Society receiving the Royal patronage was founded in the year 1790, under its present name. It continued in full operation until the foreign occupation consequent on the disastrous overthrow at Jena, during which it was suppressed by the French, and remained dormant till the close of the year 1813 ; at which period it was reconstituted and obtained an accession of very able men, such as Hagen, Bessel, Müller, Burdach, Gaspari and others.

Its character now underwent a change, and from an Agricultural and Geological Society, it became one of Science generally. Thus we see the illustrious Bessel reading his first Essay on Cometary Orbits before the Society in 1816. Amongst the Presidents of the Association we notice the names of Professors Eisenhardt, Meyer, Dove and Zaddach, all well known throughout Europe as true philosophers and sound scholars.

In the political disturbances of 1848-49 the Society came under the clutches of the Police, and its meetings became less frequent and finally ceased ; but at length in March 1860 it came to life once more, and we have the best evidence of its vitality in the two numbers of its Journal, published in September 1860 and March 1861, which form the heading of this article. The Society consists almost entirely of men of Science, College professors, and makers of mathematical and optical instruments.

The contents of the two numbers alluded to are very interesting to the lovers of Science generally. In the first number there is a capital description of Amber, a substance well known to most of our readers, yet never before subjected to an accurate and exhaustive chemical analysis, so far as we are aware. It is found on the southern shores of the Baltic in certain localities and is washed up most abundantly in the autumnal and winter storms. A chemical analysis gives its composition as follows :—

| | |
|---|---|
| Water .................... | 2.6 |
| Coal ...................... | 2.4 |
| Oxy. Sulphate of iron . ...... | 0.72 |
| Sulph. Lime................ | 0.82 |
| Oxid. Iron ................ | 8.48 |
| Clayey Earth................ | 4.43 |
| Chalky " ............. | 0.10 |
| Sulph. Acid................ | 1.10 |
| Magnesia .................. | 0.41 |
| Silicic Acid................ | 16.15 |
| Quartz and other fragments .. | 62. |

In another article there is a curious account of certain human skeletons found near Tilsit close to the Russian frontier. It appears that in the year 1858 during the progress of certain excavations, the work people came upon a large number of human skeletons, the ornaments upon which buried with the bodies, showed that they belonged to some of the old German nations. The skulls were taken away and submitted to close examination and comparison. The races formerly inhabiting these regions were supposed to be the old Prussian and Slavic; but in comparing

them with skulls of those tribes preserved in the Berlin Museum, the following marked differences of measurement were observed :—

Comparison of length to breadth, the latter being taken as 1000.

| | |
|---|---|
| Slavic | $\frac{1173}{1000}$ |
| Old Prussian | $\frac{1445}{1000}$ |
| Tilsit Skull. | $\frac{1540}{1000}$ |

Again taking length with height, the latter being assumed as 1000, we have :—

| | |
|---|---|
| Slavic | $\frac{1299}{1000}$ |
| Old Prussian | $\frac{1714}{1000}$ |
| Tilsit Skull | $\frac{1862}{1000}$ |

So that the ancient skulls, far from being of a low barbaric type, are of the highest Dolicho cephalic character. The inference is plain that these skulls belong neither to the Slavic, or old Prussian, nor to its cognate Lithuanian Races. But strange to say they have a marked affinity and resemblance to the Celtic skulls in the same Museum. The writer therefore deduces the almost moral certainty that in the pre-historic age the Eastern shores of the Baltic were inhabited by a branch of the Celtic people; and that that race had a much wider territorial expansion than is usually assigned to it.

Amongst other articles of general interest is one on the Coca, the plant in South America whose leaves possess the singular property of in themselves enabling men to undergo extraordinary

fatigue and privation. The Coquero Indians generally use from ½ to 1 ounce per diem, which they chew and go for weeks without further aliment exposed to the inclemency of the weather and in other respects to absolute starvation. A chemical analysis gives an alkaloid, "Cocaine," which bears a strong resemblance to Aconite, the active principle of Bella donna, and like it, has the property of dilating the pupil of the eye.

In both France and Prussia for some years past, statistical returns connected with fatal accidents from Electricity, have been carefully kept and published. In France during 17 years, no less than 1308 people have been struck dead by lightening, giving a yearly average of 72.22 persons. Prussia gives an almost exactly similar average viz. 72.25. In both countries, the male victims are much in excess of the females. In Prussia the districts of greatest mortality from this cause stand in the following order,—1. Province of Prussia, 2. Silesia, 3. Brandenburg, 4. Pomerania, 5. Westphalia, 6. Rhenish Prussia, and least of all the Polish Duchy of Posen. According to these returns the greatest number of accidents happened in and near buildings ; then come the open fields ; and, contrary to the popular belief the fewest occurred *under trees.* To those acquainted with the German language we strongly recommend a regular perusal of this scientific journal ; the two first numbers are most promising, beautifully printed and profusely illustrated; and the topics are well chosen and ably treated.

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## XIX..—*The Origin of Brahmanism.* By MAJOR H. CONGREVE.

Three accounts are extant of the invasion of India under heroes named Bacchus, Rama, and Osiris. The first is a Greek legend, the second is of Indian origin and the third is Egyptian. I am persuaded they all refer to the same expedition, and that from its arrival in India dates the dawn of Brahmanism in this country.

### GREEK ACCOUNT OF THE INVASION.

Bacchus marched into the East for the conquest of India, at the head of a large Army. He was accompanied by Pan, Silenus, and

the Satyrs. He effected the subjugation of the country. The poet Dionysius thus refers to the adventure of Bacchus:

"There is moreover, wonderful to tell,
In the rich region, which the Ganges laves,
A pass esteem'd most sacred: this of old
Bacchus is said, in wrathful mood, distress'd,
To have traversed, what time he changed
The soft Nebrides for a shield of brass;
And for the Thyrsus, bound with ivy round,
He couched the pointed spear."

INDIAN ACCOUNT OF THE INVASION.

Rama a conqueror of the highest renown, and extirpator of the indigenous royal races in India, delivered nations from tyrants, and subjugated the Deccan at the head of an army of monkies, the general of which was Hanumunta. The throne of Rama was usurped by his brother Bharata, and he wandered far in search of his consort Sita.

EXPEDITION TO INDIA DERIVED FROM EGYPTIAN SOURCES.*

In the history of Osiris he appears as a great conqueror, who travelled over the face of the whole earth, winning new territories wherever he came. He is said to have been the son of Rhea; and his chief attendants were Pan, Anubis, Macedo, and Maro a great planter of vines. The people of India claim Osiris as their own. Many make him a native of Egypt, and mention his travels through Arabia and Ethiopia to India, which he conquered; whence he turned back to Egypt. He built cities in various parts of which the most remarkable was Hecatompulus or Theba. He is particularly stated to have introduced the vine everywhere in his excursions, which appears to identify him with Bacchus. He was esteemed a great blessing to the Egyptians both as a lawgiver, and as a King. The people of Memphis shewed his Taphos, or high altar tomb under which he was supposed to be buried. The solemnities at the burial of Osiris were distinctly Bacchic. The pri ts wore panther skins, carried Thyrsus staves, and convulsed themselves like the Bacchautes. His throne was usurped by his

* We are indebted for the preservation of this portion of Egyptian history chiefly to Herodotus, Diodorus, Plutarch, and Eusebius.

brother Typhon, and he wandered in search of his lost wife Isis, in the same manner as Rama after Sita. Isis afterwards sought for his scattered limbs, as her counterpart Demeter did for those of Bacchus. On his expedition to India, Osiris was accompanied by Apollo and Pan, and he left the care of Egypt to his minister Hermes. To dismiss the absurdity of monkies or Satyrs being employed in the expedition, we must assume that the effigy of the Egyptian god Pecht, the same as the Greek Pan, and the Hindu monkey god Hanuman, was borne on the banners of the army.

I shall endeavour to prove who the heroes of the expedition really were, commencing with the most prominent. I express my conviction that Osiris or Bacchus, is actually Misraim, afterwards deified in India as Bramah, and that Rama his nephew (Genesis Chap. X. v. 6-7 ) is the Rama of Hindu Mythology. Misraim, Rama, and Cush are allowed to have been the most powerful and adventurous of the children of Ham who settled in Africa ; and there is reason to believe the two last along with Seba, accompanied the expedition of Misraim. The belief that Government was first established, laws enacted, and religion introduced in India by Rama, about 3,800 years ago, corresponds with the date assigned to the death of Noah, and the settlement of his immediate descendants.

The association of the name of Misraim with such names as Bacchus and Osiris, may at first excite the surprise, and disturb the prepossessions of some of my readers ; but I beg they will reserve their criticism until they have completed the perusal of this paper, in which, I can assure them, they will find nothing in opposition to the sacred books of the Old Testament ; while, the more to set their minds at ease, I add, that the right thinking Sir W. Jones acknowledged the identity of the two Ramas* to have occurred to his mind as being more than probable. I remind them, moreover, that, the Jews alone preserved real names in their genealogies,—the Pagan Greeks and Egyptians bestowing new names and additional titles upon the ancient heroes, whom they deified, and to whom they ascribed exploits, and gave attributes

* The Hindu Purans speak of the love felt by their Rama for the land of Egypt.

too extravagant to belong to human beings. Moreover, if the Pagans could render Japhet into Jupiter or Zeus; Noah into Saturn or Chronos, and Naphtuhim into Neptunus; it is quite as probable they would give the appellation of Bacchus to Misraim, whose grand father taught mankind the use of the grape (Gen. IX 20. In like manner Misraim was called Osiris by the Egyptians. Although he figures so conspicuously under this designation, in the Egyptian religion, it is not a necessary consequence that Misraim himself abandoned the simple faith of his fathers. In the progress of a long reign, he may have won the affections of his subjects so considerably, as to have been elevated to the dignity of a deity, and had idols, and statues erected to him by the priests, at that time the most idolatrous in the world, and been placed at the head of their system;* thus we find that Arbelus or Belus, son of Nimrod, was among the first who was honored by his subjects with the title of Deity.† The name of Misraim preserved in

* History furnishes examples of foreigners, both by birth and religion, being raised to the supreme power, and held in high veneration after their decease. The Parthians, after their separation from the Seleucidae, remembered with affection their Greek conquerors of former times. In the legends of some of my Parthian coins appears the following in Greek "The King of Kings, ........ the Great, the Just, the Beneficent, the illustriously born, the Lover of the Greeks." Scipio was invited by the Spaniards he conquered to become their King. The Prætor Scaevola Governor of Asia, had festal games instituted in his memory by the grateful Asiatics. Bernadotte was confirmed King of Sweden by the voice of the people.

Whether Misraim founded the Egyptian religion, whether he became a convert to it, or whether adhering to the simple patriarchal religion, he employed that of his newly acquired or adopted country as a political engine, are points which will probably ever remain in obscurity. For my own part, as the text indicates, I am inclined to adopt the last supposition. Hestiaeus quoted by Josephus says: "Such of the priests as were saved from Babel took away with them the sacred vessels of Jupiter," a testimony to very early apostacy among the immediate descendants of Noah.

† And among the Greeks, Ganymede, Cleitus, Tithonus, Orion, Castor and Pollux, Ino, and Hercules were made deities during their existence as human beings.

the word Misr a name of Egypt, and the surname Misr or Misra appertaining to the Brahmins in the west of India, manifest how religiously his memory was cherished both in Egypt and India; at the same time the name of his nephew Rama is found in Egypt as Rameses, another name of that country;* and in India in Rama, an incarnation of Vishnu, the second person of the Hindu Triad, facts evincing how greatly he too was venerated in those countries. The names of Misr, Cush, Rama, and Seba remain unchanged in Sanscrit, and are highly revered by the Hindoos.

An objection may be advanced against the possibility of Misraim collecting a force adequate for the invasion of the remote India; but it is untenable, with the facts before us that in Misraim's life time Nimrod erected vast cities capable of containing tens of thousands of inhabitants, and that he could assemble large bodies of men to carry incursions into neighbouring territories. Trogus Pompeius (in Justin) writes that; "Egypt was a most flourishing and magnificent country before Ninus was born." Berosus testifies that within 140 years after the flood, Spain, Italy and France were peopled. I do not maintain that India was, in the first instance, peopled by a colony from Egypt; my intention being to demonstrate, if possible, when and whence Brahmanism was introduced in India, and who the principal Gods belonging to it really were; nor do I desire to conceal the fact that my view of the connection between Egypt and India is at variance with most authors and critics who have treated the subject: civilization and religion is considered by them to have been brought from India to Meroë south of Egypt, and thence to have descended with the stream of the Nile into Lower Egypt. I cannot concur in this opinion, when I reflect how utterly contrary such a migration would have been to the will of the Brahmins who forbid their followers to quit India. Sir W. Jones confirms these views. "M. Sonnerat" he says, refers to a dissertation by Mr. Schmit which gained a prize at the Academy of Inscriptions, "On an Egyptian colony established in India." "It would be worth while to examine his authorities, and either to overthrow, or verify them by such higher authorities as are accessible in these provinces. I

* Ra is the name of one of the Egyptian Gods.

strongly incline to think him right, and believe that Egyptian priests have actually come from the Nile to the Ganga and Yamuna, which the Brahmins most assuredly would never have left."

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*Facts contributing to prove that Misraim was deified in Egypt as Osiris, and in India as Bramah.*

1. On the authority of Herodotus we find that Osiris wrote the following inscription; "Saturn the youngest of all the Gods, was my father (or ancestor) I am Osiris who conducted a large and numerous army as far as the deserts of India." Saturn of the ancients is always considered to mean Noah, who was the grand-father of Misraim.

2. Osiris is said to have left his country under the care of his wife, and of Hermes. This Hermes by all historians is allowed to be the same as Toth-Athothes. Toth succeeded Menes, the Egyptian name for Misraim according to Bunsen, and was called Herinogenes. Manetho says that the same Athothes was a physician and left the anatomical books. Sanchoniatho says, "Toth was a relation of Misr (Misraim) he invented the writing of the first letters, him the Egyptians call Thoor, the Alexandrians Thoyth, and the Greeks Hermes." Lempriere states, he lived in the age of Osiris and wrote books on Medicine, Theology, &c. Toth or Thut is in reality Phut the brother of Misraim; Phut accompanied Misraim to Egypt, and according to ancient writers afterwards settled in and ruled over Libya. Menes (Misraim) according to Herodotus was the first king of Egypt.

3. Bacchus or Ba-cush means literally the brother of Cush, Bacchus is Osiris,* Misraim is the brother of Cush, therefore Mis-

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* Diodorus states that the Egyptians insisted their God Osiris was the Dionysus or Bacchus of Greece. According to Arrian, the Indians gave the same account of Dionysus as the Egyptians did of Osiris. Strabo writes, that the people upon the Indus maintained that Dionysus was a native of their country, and the city Nusa near Mount Meru was the place of his birth. There were, however, some among them who allowed that he came into their parts from the West. He taught them to make wine. His Indian expedition lasted three years. He had among many attendants the Satyrs. Dionysus, according to Pausanias, was exposed in an ark like Osiris.

raim and Osiris are the same. The memory of Osiris as Bacchus has been preserved by the people of India as Brahma. Bromius was one of the names of Bacchus in Rome, whence the Brumalia or festival in honor of Bacchus held there in the month of December. His memory however, owing to his return to Egypt, has not been so dearly cherished by the Hindoos as that of Apollo or Rama who accompanied him to India, hence we find that although considered the first person of the Hindoo Triad, he is not so much regarded in it as Vishnu or Apollo. For the above reason the wanderings of Osiris and Isis have been transferred by the Hindoos to Vishnu, or Rama, and Sita his wife; while the deprivation of the virility of Osiris, has been transferred to Siva who suffered, in the same manner, by the curse of the holy sages in the Daravanam forest. After the member of Osiris was lost it was worshipped as the lingam in Egypt by order of Isis; Osiris was carried about as a moveable phallus by the Egyptian women, and his statues had an enormous phallus or lingam; a triple phallus was also carried about in processions. The custom of reverencing the same object is still preserved among the boatmen on the Nile.

It is an indisputable fact, that the worship of Osiris distinguished by the same attributes and emblems, has continued in India from the earliest ages to this day, under the appellation of Ishwara a name of Bramah.* This may be completely proved by a comparative survey of both. As patron of the vine Osiris was adored in Egypt, and as Bacchus in Greece under the same emblem of the phallus. It is under this emblem that he is still venerated in Hindustan; and Phalla is one of the names of Ishwara. The bull was sacred to him in Egypt as it is in India. Plutarch informs us, that the Nile flows through the country of Egypt, and is said to have its source in the tresses of Osiris. The Ganges in like manner is fabled by the Hindus to flow from the locks of Ishwara; hence another of his names Gangadhara the supporter of the Ganges. The attendants of Ishwara resemble, in their frantic demeanour, the furious Bacchantes of the God of Naxos. It is re-

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* "When the Hindoos consider the Divine power exerted in creating they call that power Bramah; when a changer of forms he is called Iswara." Sir W. Jones. Iswara is also a name of Siva.

markable that many of the appellations, by which the Greeks distinguish Bacchus, are also used by the Hindus ; whilst both nations have their legends to account for them. Thus, the Greeks named Bacchus, Dimeter, having two mothers, the Hindus call the son of their Bacchus Divimatri, with the same signification. Pyrigenes "born from fire," and its equivalent in sanscrit Agnija are respectively Greek and Indian appellatives of Bacchus. The title of Thriambus, we are told by Diodorus, was assumed by the Greek deity in his triumph after the conquest of India. Tryambo, in like manner, is one of the most common appellations of the Indian Bacchus.

During my residence at Thebes I obtained from the natives small effigies of the lingam in porcelain found in the tombs : these were used as neck ornaments by the women of ancient Egypt, as they are to this day by the females of the Lingayets or worshippers of the lingam in India. Osiris is said to have had his throne usurped by his brother Typhon in the same manner as Rama's was by his brother Bharata.

4. Misraim is the son of Ham, Osiris the son of Jupiter Ammon or Ham.

5. Misraim called Menes by the Egyptians, seems also to be alluded to in that Menu of the Hindoos who framed the Institutes, or Book of Civil and Religious duties, such a work as we might expect would be introduced by the founder of a new nation. This book is one of the oldest the Hindoos possess, and is said to be addressed to the first inhabitants of the earth, by which, of course, is meant India by the Brahmins. It is worthy of remark that, according to Scripture, Misraim or Menes had seven sons, and Menu of the Hindus also had seven sons or Rishis, fathers of the Pitris or Patriarchs of India.

6. From Chronos and Rhea came Osiris; Chronos is Noah, the ancestor of Misraim.

7. Ekoris or Vexoris of Egypt, mentioned by Justin, is Osiris; and this Ekoris is supposed to have been Misraim, by old writers.

8. Misr or Misra, the same as Misraim, is a surname of the

Brahmins in the West of India, where the name is held in the highest veneration.

9. On my shewing the Egyptian Pantheon to a Hindoo he at once identified the robed Osiris as Bramah.

10. The relations of Misraim, viz: Ham, Seba, Sabtechah, and Phut have had their memories preserved in Egypt in the names of the Gods Amun, Seb, Set, and Toth.

11. The great gods of the Osiris circle, seven in number with a transition to an eighth, including Osiris himself, had for their originals, probably, Misraim and his seven sons. The statues of the God of Memphis, Ptah Osiri, or Osiris, and his seven sons, were shewn to Cambyses in the temple of that city. A Gana or circle of Hindoo gods consisted of eight Vasus.

12. Osiris is the human God, the God-man of Egypt.

13. Diodorus writes that Osiris said of himself "I am the son of Chronos born of an egg." Precisely the same myth attaches to the birth of Bramah in Indian Mythology.

14. How far the names of other members of the family of Ham have spread in the East appears below:

| Ancient names of the family of Ham preserved. | | Countries. | | Names of Gods. |
|---|---|---|---|---|
| Ham | in | Thibet | as | Mahaammonee. |
| Phut | ,, | Siam | | |
| Cush | ,, | China | ,, | Saka. |
| Cush | ,, | Tonquin | ,, | Chaka and |

Ham, in Ava and India, as Godama.

The name of Ham, Amun, or Aum, has been preserved in the names of the Buddhist Gods, thus.

| | | |
|---|---|---|
| God | A U M | a |
| Got | A U M | a |
| G | A U M | uta |
| Maha | A M U N | ee |

while the element is contained in the Hindu name of God SAUMy and in Br A Mah, and RAMah.

The following extract from a Hindu sacred book attests the reverence paid to the name of Ham or AUM by the Hindoos: "Let *om* be first said, then *nama*, and afterwards narayanaya; *om* is one syllable, *nama* is two syllables, and *narayanaya* five syllables; thus *om narayanaya nama* is that eight syllabled invocation, from the repetition of which are obtained long life, wealth, and progeny, and finally immortality by participating in the ineffable bliss of God. The syllable *om* is the same as A U M and he who repeats these letters thus joined together, shall be delivered from the miseries of transitory existence, and shall ascend to Vaikuntha."

15. In number the brothers Seba, Havilah, Sabtah, Ramah, and Sabtechah, mentioned in Scripture, as the sons of Cush, and nephews of Misraim, correspond with the Hindu Puncha Pandava, or five ancient Demi-gods, of whom there is a tradition throughout India. Many of the attributes of the Pandoos belong to the leaders of the Egyptian expedition to India. The five Pandoos, moreover, are the great grandchildren of the Ganges, an allegorical allusion to Noah; and in that relationship are cognate with the five sons of Cush who are the great grandchildren of Noah. And the name of one of the Pandoos is Dherma Rajah, who is Godama, or Buddha, who is an incarnation of Rama, the name of one of the sons of Cush. Chronologically the five Pandoos may also be compared with the five sons of Cush; thus the last Pandoo ended his reign in the year of Kaleyugam 1036, or 3911 years ago; Misraim was established in Egypt 2188 B. C. 4033 years since.

By subtracting one date from the other, we obtain one hundred and twenty two years as the period between Misraim's settlement in Egypt, and the death of the last of the five Pandoos, or his nephews, the sons of Cush, about the time to be expected.

16. The first Prince mentioned as reigning in the Brazen age of the Brahmins is called Cusha. The mother of Rama of the Hindoos is called Cushala, probably signifying the wife of Cush. The father of Rama is called Dasaratha signifying that his war chariot bore him to all quarters of the Globe, a title applicable to Cush the son of Ham, whose conquests are handed down in the

names of certain countries, as Cushan the ancient name of Ethiopia, in Cuthay the ancient name of China, Cushgar, Cushmir, Cutch, &c.

17. Iswara, or Brahma (in the Vrihadhaima) is said to have descended from Heaven, and to have chosen for his abode the land of Misra or Egypt.

18. The name Osiris, or more properly "Isiris" signified in Egypt "the Lord." Ysiris in Sanscrit has the same meaning and is applied to Bramah.*

19. Krentzhemius, quoted by Raleigh, says, that "Misraim and Osiris are words of near affinity, and found in the Hebrew tongue;" and Raleigh adds, "neither do I see cause of doubt whether Osiris were the same with Misraim."

20. Syncellus says that "Menes was Misraim;" Menes, by the Egyptians was considered the Lunar God with the Hippopotamus; Osiris holds the same position. Osiris was exposed in an ark, Misraim may have been in the ark with his father Ham. The Brahmins assert that Bramah issued from the side of Vish-*nu* while the latter was borne in a shell, or ark on the face of the waters. *Nu* is the common oriental name of Noah.

*Inferences from the foregoing facts arranged in Corresponding order.*

From the 1st. That Osiris is Misraim.

" 2nd. Phut (Hermes or Toth) the brother of Misraim is shewn to have lived in the reign of Osiris, King Menes, Misraim, or Misor was coeval was Toth, and consequently with Osiris. As it is not likely two Kings reigned over Egypt contemporaneously, one carrying his conquests so far as India, we may fairly conclude Osiris and Misraim to be the same personage, if other proofs even were wanting.

" 3rd. That Osiris is Misraim; and, after the conquest of India by him, alluded to in the Greek, Indian, and Egyptian accounts which mutually confirm each other, he was worshipped in India as Bramah.

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* "Hsiris" according to Bunsen's spelling.

From the 4th. That Osiris is Misraim.

,, 5th. That Misraim was present at one time in India, and his memory has been dearly cherished by the Brahmins.

,, 6th & 7th. That Osiris is Misraim.

,, 8th. That the name of Misraim was held in high veneration in India; and that he was there worshipped as Bramah.

,, 9th. That Osiris (Misraim) is Bramah.

,, 10th. That the relations of Misraim were canonised in Egypt.

,, 11th. The same, and also in India.

,, 12th. That Osiris was a human being exalted to the rank of a deity in the same manner as I suppose Misraim to have been. Osiris is alluded to by historians as a monarch, while his name is most prominent among the Egyptian gods, as will presently appear.

,, 13th. That Osiris, Misraim, and Bramah are the same.

,, 14th. That Ham, father of Misraim was reverenced in the East wherever Brahminism or Buddhism took root.

,, 15th & 16th. Chronological and traditional evidence that the memory of Misraim and his relations, was preserved by the Brahmins; and countenances the belief, of his having been deified under the name of Bramah.

,, 17th. That Bramah (Osiris or Misraim) once dwelt in Egypt.

,, 18th. That Bramah, Osiris, and Misraim are synonymous.

,, 19th. Countenances the thesis that Osiris and Misraim are the same.

,, 20th. That Bramah, Osiris and Misraim are the same.

The Egyptian account of the invasion of India by Osiris states he was accompanied by Apollo* and Pan, and that he left the care of Egypt to Hermes. From what has preceded I think there are

* The Indian Apollo is Rama Chrishna.

reasons sufficient for believing, that by Osiris is meant Misraim, by Apollo Ramah, and by Hermes Phut; that the Egyptian god Sevek or Seb is really Seba the nephew of Misraim, and that in India these personages have been venerated as Bramah, Ramah, and Siva, and Pan as Hanumunta; in other words that the actual personages of the Hindu trinity, Bramah, Rama, and Siva, are Misraim, Rama, and Seba of Genesis.

That Egyptism and Brahminism are but different designations of one religion, the latter deriving from the former, I think is unquestionably proved by what subjoins:

1. In both countries the deities are identical, vide annexed list.

2. The Pagodas and other places of religious worship in India correspond in architectural plan and details with those in Egypt, The most striking examples of resemblance, I might say identity. are these:

| In Egypt. | In India. |
|---|---|
| The pyramidal tower or propylon surmounting gateway of pagodah at Edfou,—and pyramids. | The pyramid over the entrance of the Tanjore and other pagodahs; and double propylons which I think I have seen somewhere in the South of India surmounting gateways of pagodahs. |
| Single pylon in inner court of Karnac. | Single pylon over entrances of smaller pagodahs in India. |
| Obelisks flanking entrance of the pagodah at Luxor. | Obelisks flanking gateway of the pagodah at Madura. |
| Great choultries at Dendera, Gau-el-Kebir, and Edfou. | Trimmel Naig's choultry at Madura, and others. |
| Open choultry at Philæ on mound near river. | Open choultry of Neerali, Madura, on bank of river. |
| Mammeisi at Elephantine. | Porches of lesser Pagodahs. |
| Rock cut temples of Siout and Ghebel Abul-Fada. | Rock cut temple in back of the rock at the seven Pagodahs, and elsewhere. |
| Colossal statues at Thebes and Abousimbel. | Colossal statues at Bamean North of Cabul. |

| | |
|---|---|
| Samee houses enshrining an idol, with a prostrate bull, or other sacred animal, fronting them, near great Pyramid, and at Thebes. | The same common throughout India. |
| Monolithic temple of Latona at Buto. | Monolithic temples at Seven Pagodahs. |
| Pillars of enormous girth, Thebes. | Pillars of enormous girth at Elephanta and elsewhere. |
| Statues of the Kings with costumes of India, in the Pagodah at Karnac. | Statues of the Kings in many southern pagodahs of India. The great pagodah at Rammisseram in the isle of Paumban contains a gallery of statues of Rajahs who enriched the establishment. |
| Rock Sculptures at Abousimbel. | Rock Sculptures at Seven Pagodahs, and Ellora. |

The ground plan of the temples in Egypt and India, is coincidental.

3. The superstition of the Metempsychosis was common to both countries.

4. The institution of castes is alike common. The ancient inhabitants of India Limyrica, like the Egyptians, were divided into seven orders, the philosophers being the most honorable.

5. The sacred literature was nearly the same in both countries. The Chanters or Lays of the Egyptian priests being the prototypes of the Vedas; and the Ordinances and Ceremonials of the Egyptian sacerdotal books, the same as the Institutes of Menu.

6. The ceremonial processions with offerings to the Gods found sculptured in Egypt, are similar to those now seen in India.*

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* The following account of a religious festival in Egypt, in Herodotus, B. 2; C. 63, furnishes the prototype of a similar ceremony in India:

"But in Papremis they offer sacrifices and perform ceremonies, as in other places; but, when the sun is on the decline, a few priests are occupied about the image, but the greater number stand, with wooden clubs, at the entrance of the temple; while others accomplishing their vows, amounting to more than a thousand men, each armed in like man-

7. The costumes of the Hindoo divinities, preserved in the dramas of the country, are such as are met with in Egyptian images. The costumes of the Kings seen on their statues at Karnac in Egypt are Indian.†

8. Human sacrifices were practised by both people.

9. The Indians, according to Curtius, served the deity Manes, the same as Menes a name of Misraim, from him the priests were styled Barachmanes or Brachmans.

10. Two languages were used in Egypt viz., the Hieratic or language of the priests, and the Demotic or language of the people; the same is the case in India. A close affinity is now found to have existed in the languages of India and Egypt. The written Abyssinian language or that of the Ethiopians, so intimately connected with the Egyptians, is written like the Indian languages from left to right, and the vowels are annexed as in Devanagari to the consonants, with which they form a syllabic system.

11. The cremation of the body by the Brahmins, and its preservation as a mummy by the Egyptians, are referable to the same cause, which is the prevention of *corruption* under the belief of a Metempsychosis.

12. Animal worship common to both religions.

13. The African physiognomy and woolly hair found on idols of the Buddhic faith, an offshoot from Brahminism, are derived from Egypt.

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ner, stand in a body on the opposite side. But the image, placed in a small wooden temple, gilded all over, they carry out to another sacred dwelling: then the few who were left about the image *draw a four-wheeled carriage, containing the temple and the image that is in it.* But the priests, who stand at the entrance, refuse to give them admittance; and the votaries, bringing succour to the god, oppose, and then strike, whereupon an obstinate combat with clubs ensues, and they break one another's heads, and, as I conjecture, many die of their wounds; though the Egyptians deny that any one dies."

† The lists of the Kings of Southern India, now nearly complete, might be easily illustrated with portraits by our photographers. Many of the pagodahs of this Presidency contain statues of Kings who were founders or benefactors.

14. The story of Vishnu cutting the body of Sati into fifty-one pieces which were scattered in different places, and each place where a part fell becoming a place of worship dedicated to the female power, is evidently copied from a similar fable in the lives of Osiris and Isis ; indeed, many of the legends of the Indian religion have been traced to Egypt, chiefly by Wilford, in the Asiatic Researches.

15. The Triad of Egypt i. e. Osiris, Horus, and Typhon is a form of the Hindu religion.

16. Cusha-dwip, or Egypt, is spoken of in the Purans with reverence ; and Cala, Nila, or the Nile is held so sacred by the Brahmins that, according to the Skanda-puran, the murder of one of their caste is expiated by bathing in its waters.

17. In the Padma Puran, we find that, Satyavarman (Noah) was found intoxicated by his son Charma (Ham) who exposed his fathers nudity to his brothers Sherma, (Shem) and Jyapeti (Japhet). Satyavarman cursed Charma in the same language recounted in Genesis. This too manifests that the Brahmins were acquainted with the history of Misraim and his relations. Plato, in his Dialogue entitled Timaeus, writes that an Egyptian priest recounted to Solon, out of the holy books of Egypt, the story of a universal deluge.*

18. The Hindu Bacchus is also called Bagis, a name very similar to Bacchus ; Bacchus (Osiris) in Egypt received offerings of spirits, and the blood of a hog ; in India the same offerings are made to the God of Wine.

19. The women of modern Egypt, following the custom of the ancient people, seat themselves on the Phallie stones among the ruins to remedy barrenness; the same superstition prevails in India.

20. Certain colours were held sacred both by the priests of Egypt, and those of India.

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* A contradiction to Bunsen's assertion that the ancient Egyptians had no record of a flood.

## Idol Gods of the Egyptians, and their Co-ordinates in Italy* and India.

| Egypt. | Italy. | India. |
|---|---|---|
| Num with the hooded snake. | | Nagum with the hooded snake. |
| Pecht the monkey god. | Pan. | Hanuman the monkey god. |
| Apis with the head of a bull. | | Nandee the bull of Iswara. |
| Phtah. | Vulcan. | Agni, god of fire. |
| Chunsu. | Hercules. | Chrishna. |
| Sebak, the crocodile headed deity. | | Varuna, with the crocodile. |
| Anubis. | Hermes. | Nared, son of Bramah. |
| Ptah, the deformed dwarf. | | Buddah Avatar, the deformed dwarf. |
| Anuke. | Vesta. | Swaha, wife of Agni. |
| Khem the phallic god. | Phallus. | The Lingam god. |
| Isis with the crescent moon. | Diana. | Anna-Purna devi, with the crescent moon. |
| Tefnu the lion headed goddess. | | Cali the lion headed goddess, and Nar Singha. |
| Apt, with the head of the hippotamus. | | Mahish Asura, a monster with head of a buffaloe living in water. |
| Isis, the lotus goddess. | Ceres | Luchmee, the lotus goddess. |
| Amun, lord of Heaven. | Jupiter Amon. | Indra god of Heaven. |
| Seb the father of Osiris. | Saturn. | The first Menu. |
| Osiris. | Bacchus. | Bagis, the patron of the Vine. |
| Hethor. | Venus marina. | Rhemba. |

* The Gods of Italy are inserted as a key to the attributes of the others.

| Egypt. | Italy. | India. |
|---|---|---|
| Isis wife of Osiris. | Isis. | Isi wife of Iswara. |
| Hethor with the head of a cow. | | Isani with the head of a cow. |
| Tet, lord of the Moon. | | Chandra. |
| Neith. | Minerva. | Sereswati, wife of Bramah. |
| Her. | Horus. | Heri. |
| Anubis, dogheaded. | Hermes canis. | Cerbura, the dog divinity of Yama. |
| Nubi with the symbol of the boar. | | Varah, the boar Avatar of Vishna. |
| The Ram headed god Nu. | | The ram headed god, attendant on Vera Bhadra. |
| Seb with the goose. | | Brahma on the goose Hanasa. |
| Apep the Serpent slain by a deity. | | Caliya the Serpent slain by Chrishna. |
| Hapi Mu the river goddess bearing aquatic plants. | | Ganga the river goddess bearing aquatic plants. |
| Anta, goddess of war wielding a battle axe and spear. | | Durgah goddess of war wielding spears and swords. |
| Typhon Bebon the destroyer. | | Buban Siva the destroyer. |
| Osiris as the great judge. | Minos. | Dhermarajah, the great judge. |
| Osiris in the tiara and dress of Vishnu. | | Vishnu. |
| Osiris as the Sun. | | Suryen, Rama Chrishna |
| Osiris or Isiris. | Bromius or Bruma. | Ysiris Bramah, Iswarah. |
| Nutpe. | Cybele. | Bhavani. |
| Ra with the hawks head. | | Garuda with the hawks head. |

| Egypt. | Italy. | India. |
| --- | --- | --- |
| The Scarabeus significant of a God or his power.* | | The Tortoise Avatar. |

If Brahminism did not come from Egypt, where else could it have come from? Certainly not from China, Arabia, or the Semitic nations on the Mediterranean, and most assuredly not from Iran, and the adjacent countries in Central Asia north of the Hindoo Kosh, the religion of whose people, from a period shortly after the deluge to a time long after Brahminism was established in India, was Zabaic and Milhraic. The discovery in Egypt of monuments of Brahminism belonging to an epoch far anterior to the existence of that religion in India, indicates plainly enough that it does not owe its origin to the latter country. During my stay in Egypt, and trip up the Nile, I was forcibly struck with the resemblance of everything around me to what I had seen in India; and my observations confirmed my opinion that there had been a very close connection in remote times between the two people. Although the inhabitants of Modern Egypt are Mahomedan, many of the customs prevailing before their era are yet preserved, this is especially the case as regards the methods of agriculture and irrigation which are completely Indian. The habits and usages of the ancient Egyptians handed down in the paintings at Beni Hassan, and in the tombs of the Kings at Thebes are those of the Hindoos; indeed, Sir G. Wilkinson's descriptions of them might, with equal propriety, be applied to those of the Hindoos.

The annexed passage from Bishop Russell's history of Egypt is so interesting, and lends so much support to my views, that I cannot refrain from inserting it;

"As a farther proof of this hypothesis, we are informed that the sepoys who joined the British army in Egypt under Lord Hutchinson, imagined that they found their own temples in the ruins of Dendera, and were greatly exasperated at the natives for their neg-

* Can these coincidences be accidental? Can we agree with Bunsen, after an impartial consideration of the preceding facts, that "nothing Asiatic is Egyptian;" or join in his sneer about the "Siren of Indiomania"?

lect of the ancient deities, whose images are still preserved. So strongly, indeed, were they impressed with this identity, that they proceeded to perform their devotions with all the ceremonies practised in their own land. There is a resemblance, too, in the minor instruments of their superstition—the lotus, the lingam, and the serpent,—which can hardly be regarded as accidental; but it is, no doubt, in the immense extent, the gigantic plan, the vast conception which appear in all their sacred buildings, that we most readily discover the influence of the same lofty genius, and the endeavour to accomplish the same mighty object. The excavater temple of Guerfeh Hassan, for instance, reminds every travelled of the Cave of Elephanta. The resemblance, indeed, is singularly striking; as are, in fact, all the leading principles of Egyptian architecture to that of the Hindoos. In both countries large masses of rock have been excavated into hollow chambers, the sides of which are decorated with columns and statues of men and animals carved out of the same stone; and in each are found solid blocks weighing many hundred tons, separated from the adjoining mountain and lifted up into the air. By whom and by what means these wonderful efforts have been accomplished is a mystery sunk too deep in the abyss of time ever to be revealed. To Greece neither country is indebted for any part of its architecture, while she has evidently taken many hints from them. Except at Alexandria and Antinoë, no edifice strictly Grecian appears in Egypt. But we need only compare the monolithic temples of Nubia with those of Mahabali-poor, the excavations of Guerfeh Hassan with those of Elephanta, and the grottos of Hadjur Silsili, as described by Pococke, with the caverns of Ellore, to be convinced that these sacred monuments of ancient days derived their origin from the same source."

## POSTSCRIPT.

In my haste to prepare this paper for publication I omitted the following:—

### Comparison of Egyptian and Hindoo Names.

| | |
|---|---|
| Ramessameno. | Ramasamee. |
| Ramases. | Rama. |
| Amenuph. | Munepah. |

| | |
|---|---|
| Chepren. | Curpen. |
| Cetna. | Kistna. |
| Chryses. | Chrishsna. |
| Chenchres. | Chenchee. |
| Cheneres. | Cheneah. |
| Menes. | Meneapen. |
| Maris. | Maree. |
| Venephes. | Venepen. |
| Pheron. | Verapen. |
| Thampthis. | Tamra. |
| Apachnas, | Apasamee. |
| Anophis. | Anasamee. |
| Amenophis. | Menu. |

The Egyptian names in the first column are obtained from Syncellus, Manetho, the old Egyptian chronicle, Eusebius, &c.

The language of the Gypsies (the posterity of the Egyptians), whom I believe, to be sprung from the colonies planted by the ancient people on the shores of the Black Sea, (vide Herodotus) and where they are met with still in great numbers especially in the adjacent Russian territory, is replete with Indian words. Mr. Borrow the Gypsy author hearing a Recruiting Officer of the late Company speaking one of the languages of India determined to proceed there, as he thought a clue had been furnished him to the origin of the Gypsy race. He was much struck with the strong similarity the two languages bore to one another, for which see last pages of Romany Ry or Lavengro.

PUBLIC WORKS DEPARTMENT.
*Public.*

PROCEEDINGS OF THE MADRAS GOVERNMENT.

Read the following Proceedings of the Board of Revenue, dated 6th August 1861, No. 4,253:—

Read the following letter from G. THORNHILL, Esq., Acting Collector of Kistna District, to W. HUDLESTON, Esq., Secretary to the Board of Revenue, Chepauk, dated Masulipatam, 1st August 1861, No. 191.

SIR,

I have the honor to report for the information of the Board that about $4\frac{3}{4}$ P. M. of the 24th ultimo, an earthquake was felt in in the village of Nandigama, as reported by the Tahsíldár of Nandigama Division in this District. The direction of the shock, which lasted but a second, was supposed to be from S. W. to N. E., and was attended with a noise similar to the report of a cannon.

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Ordered to be submitted for the information of Government.

(A true Copy and Extract.)

(Signed) W. HUDLESTON,
*Secretary.*

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ORDER THEREON, 10th August 1861, No. 1,525.

Order to be recorded.

(True Extract.)

(Signed) C. G. MASTER,
*Deputy Secretary to Government.*

# Meteorological Observa

JANU

| Month and date. | Standard Barometer. Inside House on the "High Ground." Mean of Observations at 9.30 A. M. and 3.30 P. M. | Diurnal Range. | Standard Thermometers. Dry Bulb at 9.30 A. M. | Depression of wet, at do. | Dry Bulb at 3.30 P. M. | Depression of wet, at do. | Dew Point from the 3.30 P. M. observations. | Humidity do. | In Verandah of the House of the Supt. of the Govt. Gardens. Max. (Self registering.) | Min. (Self registering.) | Portion of sky clear. O. being all cloud 10 pure Sun shine. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 27·27 | ·1 | | | 70 | 5 | 62·5 | ·78 | 79½ | 60 | |
| 2 | ·29 | ·1 | | | 70 | 5 | 62.5 | ·78 | 77 | 60 | |
| 3 | ·33 | ·1 | | | 71 | 6 | 63·5 | ·78 | 78 | 60½ | |
| 4 | ·35 | ·1 | | | 70 | 10 | 55· | ·61 | 74 | 58½ | |
| 5 | ·38 | .12 | | | 70 | 10 | 55· | .61 | 77½ | 58 | |
| 6 | ·38 | .12 | | | 70 | 9 | 56·5 | ·64 | 79 | 59 | |
| 7 | ·36 | .12 | | | 70 | 8 | 58· | ·67 | 80 | 60 | |
| 8 | ·33 | ·14 | | | 70 | 4 | 64· | ·82 | 78 | 59½ | |
| 9 | ·32 | ·12 | | | 71 | 6 | 62· | ·74 | 81½ | 62 | |
| 10 | ·31 | ·1 | | | 71 | 6 | 92· | ·74 | 81 | 61½ | |
| 11 | ·30 | ·12 | | | 70 | 7 | 59·5 | ·71 | 80 | 61 | |
| 12 | ·29 | ·1 | | | 70 | 9 | 56·5 | ·64 | 82 | 60 | |
| 13 | ·31 | ·1 | | | 70 | 9 | 56 5 | ·64 | 79 | 58 | |
| 14 | ·35 | ·1 | | | 70 | 9 | 56 5 | ·64 | 77½ | 55½ | |
| 15 | ·32 | ·12 | | | 70 | 9 | 56 5 | ·64 | 77¾ | 57½ | |
| 16 | ·33 | ·1 | | | 71 | 9 | 57·5 | ·64 | 78½ | 62½ | |
| 17 | ·35 | ·1 | | | 71 | 9 | 57·5 | ·64 | 81½ | 61 | |
| 18 | ·34 | ·12 | | | 71 | 8 | 59· | ·67 | 80½ | 62 | |
| 19 | ·37 | ·1 | | | 70 | 7 | 59 5 | ·71 | 81 | 61¼ | |
| 20 | ·35 | ·1 | | | 70 | 8 | 58· | ·67 | 81 | 58½ | |
| 21 | ·33 | ·1 | | | 69 | 9 | 54·6 | ·62 | 79½ | 61 | |
| 22 | ·31 | ·1 | | | 70 | 9 | 56·5 | ·64 | 79½ | 58½ | |
| 23 | ·33 | ·1 | | | 71 | 11 | 54·5 | ·58 | 79½ | 62 | |
| 24 | .35 | ·1 | | | 71 | 10 | 56· | ·61 | 81 | 60 | |
| 25 | ·33 | ·1 | | | 71 | 11 | 54·5 | ·58 | 80¾ | 57½ | |
| 26 | ·35 | ·1 | | | 71 | 10 | 56· | ·61 | 81¼ | 59½ | |
| 27 | ·33 | ·1 | | | 70 | 10 | 55· | ·61 | 81¾ | 65 | |
| 28 | ·31 | ·1 | | | 71 | 9 | 57·5 | ·64 | 84½ | 64½ | |
| 29 | ·31 | .1 | | | 73 | 8 | 61· | ·68 | 83½ | 66½ | |
| 30 | ·33 | .1 | | | 73 | 8 | 61· | ·68 | 83 | 66 | |
| 31 | ·33 | ·1 | | | 74 | 9 | 60·5 | ·64 | 83¼ | 67 | |
| **Monthly Means.** | | | | | | | | | | | |
| | 27·3 | 0·1 | 67·8 | 5·6 | 70 6 | 8·3 | 58·2 | 66·6 | 80·0 | 60·8 | |

## tions at Bangalore—1860.

ARY.

| *Wind.* Whewell's. Horizontal movement in 24 Hours in Miles. | *Wind.* Whewell's. General Direction | *Rain.* Crossley's. Inches and tenths. | Moon. Phases of. | |
|---|---|---|---|---|
| | | | ☽ | |
| | | | ○ | |
| | | | ☾ | 2 shocks of earthquake felt during night, on the Shevaroy Hills. |
| | | | | Thermometer 34 at day break, in Sir T. Munro's Tent in 1800 on the western Ghauts. |
| | | | ● | |
| | | | ☽ | |
| | | *Total.* | | |

| | Laul Baugh | High Ground |
|---|---|---|
| Mean Monthly Temperature ............ | 70·4 | |
| Maximum.... ............... ....... | 84·5 | |
| Minimum. .......................... | 55·5 | |
| Mean diurnal Range.................... | 19·2 | |
| Monthly Range........................ | 29·0 | |
| Mean of observations of Dry Bulb inside House at 9.30 A. M. & 3.30 P. M.... | ...... | 69·2 |
| ,, Depression of wet at do. do. | .... . | 7·0 |
| ,, Dew Point. at do. do. | ...... | 58·0 |
| ,, Evaporation Force of at do. | ..... | ·22 |
| ,, Humidity. at do. do. | ...... | ·69 |

## FEBRU

| Month and Date. | Standard Barometer. Inside House on the "High Ground." Means of observations at 9.30 A. M. and 3.30 P. M. | Diurnal Range. | Standard Thermometers. Dry Bulb at 9.30 A. M. | Depression of wet, at do. | Dry Bulb at 3·30 P. M. | Depression of wet, at do. | Dew Point from the 3.30 P. M. observations. | Humidity do. | In Verndah of the House of the Supt. of the Govt. Gardens. Max. (Self registering.) | Min. (Self registering. | Portion of sky clear. O. being all cloud 10 pure Sun shine. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 27·31 | ·1 | | | 76 | 9 | 62·5 | ·64 | 84 | 66 | |
| 2 | ·33 | ·1 | | | 76 | 9 | 53·5 | ·64 | 85 | 65 | |
| 3 | ·35 | ·1 | | | 76 | 11 | 59·5 | ·58 | 86½ | 64½ | |
| 4 | ·33 | ·1 | | | 76 | 11 | 59·5 | ·58 | 86 | 63½ | |
| 5 | ·35 | ·1 | | | 77 | 13 | 57·5 | ·53 | 85¼ | 61 | |
| 6 | ·34 | ·12 | | | 77 | 14 | 56· | ·50 | 84 | 60½ | |
| 7 | ·33 | ·1 | | | 77 | 14 | 56· | ·50 | 83 | 62 | |
| 8 | ·31 | ·1 | | | 77 | 14 | 56· | ·50 | 82 | 63 | |
| 9 | ·31 | .1 | | | 77 | 16 | 53· | ·45 | 83 | 60 | |
| 10 | .34 | ·1 | | | 75 | 13 | 55·5 | ·53 | 85 | 58 | |
| 11 | ·26 | ·12 | | | 75 | 14 | 54· | ·50 | 84 | 59 | |
| 12 | ·34 | ·1 | | | 76 | 11 | 59·5 | ·58 | 86 | 61 | |
| 13 | ·27 | ·1 | | | 77 | 13 | 57·5 | ·53 | 88 | 62 | |
| 14 | ·25 | ·1 | | | 75 | 12 | 57· | ·55 | 87 | 62½ | |
| 15 | ·30 | ·06 | | | 75 | 12 | 57· | ·55 | 84½ | 66 | |
| 16 | ·27 | ·1 | | | 76 | 8 | 64· | ·68 | 85 | 68 | |
| 17 | ·28 | ·12 | | | 76 | 5 | 68·5 | ·78 | 87 | 71 | |
| 18 | ·26 | ·12 | | | 76 | 6 | 67· | ·75 | 88½ | 69 | |
| 19 | ·20 | ·12 | | | 76 | 8 | 64· | .68 | 89½ | 70 | |
| 20 | ·20 | ·12 | | | 78 | 13 | 58·5 | ·53 | 99 | 70 | |
| 21 | ·22 | ·12 | | | 78 | 11 | 61·5 | ·58 | 88½ | 68½ | |
| 22 | ·22 | ·12 | | | 78 | 11 | 61·5 | ·58 | 88 | 68 | |
| 23 | ·20 | ·12 | | | 79 | 11 | 62·5 | ·58 | 89½ | 69 | |
| 24 | ·21 | ·1 | | | 80 | 12 | 62· | ·56 | 88½ | 73 | |
| 25 | ·19 | ·1 | | | 80 | 12 | 62· | ·56 | 89 | 74 | |
| 26 | ·20 | ·12 | | | 79 | 11 | 62·5 | ·58 | 88 | 70½ | |
| 27 | ·19 | ·1 | | | 80 | 11 | 63.5 | ·59 | 88½ | 71 | |
| 28 | ·21 | .1 | | | 80 | 12 | 62· | ·56 | 90 | 70 | |
| 29 | ·22 | ·08 | | | 79 | 14 | 58. | ·50 | 90½ | 67 | |
| MONTHLY MEANS. | 27·3 | 0·11 | 72·5 | 7·8 | 77·1 | 11·4 | 59·7 | 57·4 | 86·7 | 65·9 | |

ARY.

| Wind. Whewell's: Horizontal movement in 24 Hours in Miles. | Wind. Whewell's: General Direction | Rain. Crossley's: Inches and tenths. | Moon: Phases of. | |
|---|---|---|---|---|
| | | | ○ | |
| | | | ☾ | |
| | | | ● | Rain near Mysore, and in the Northern Talooks of Bangalore Division. |
| | Total | | | |

| | Laul Baugh | High Ground |
|---|---|---|
| Mean Monthly Temperature............ | 76·3 | |
| Maximum. ............................ | 90 5 | |
| Minimum. ............................ | 58 0 | |
| Mean diurnal Range.................. | 20·7 | |
| Monthly Range........................ | 32 5 | |
| Mean of observations of dry Bulb inside House at 9.30 A. M. & 3.30 P. M. .. | ...... | 74·8 |
| ,, Depression of wet at do do | ...... | 9 6 |
| ,, Dew point. at do do | ...... | 60 6 |
| ,, Evaporation Force of at do do | ...... | ·31 |
| ,, Humidity. do do | ...... | ·62 |

MAR

| Month and Date. | Standard Barometer. Inside House on the "High Ground." Mean of observations at 9·30 A. M. and 3.30 P. M. | Diurnal Range. | Standard Thermometers. Dry Bulb at 9·30 A. M. | Depression of wet, at do. | Dry Bulb at 3·30 P. M. | Depression of wet, at do. | Dew Point from the 3·30 P. M. observations. | Humidity do. | In Verandah of the House of the Supt. of the Govt. Gardens. Max. (Self registering.) | Min. (Self registering.) | Portion of sky clear. O being all cloud 10 pure Sun shine. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 27·23 | ·1 | | | 80 | 14 | 59· | ·50 | 91 | 69 | |
| 2 | ·21 | ·1 | | | 79 | 13 | 59·5 | ·53 | 91 | 68 | |
| 3 | ·20 | ·12 | | | 79 | 13 | 59·5 | ·53 | 92 | 67 | |
| 4 | ·19 | ·1 | | | 79 | 14 | 58· | ·50 | 91 | 67 | |
| 5 | ·21 | ·1 | | | 79 | 15 | 56·5 | ·48 | 91 | 66½ | |
| 6 | ·23 | ·1 | | | 79 | 16 | 55· | ·45 | 91¾ | 69½ | |
| 7 | ·20 | ·16 | | | 79 | 14 | 58· | ·53 | 90 | 68½ | |
| 8 | ·18 | ·12 | | | 80 | 13 | 60·5 | .53 | 89½ | 71 | |
| 9 | ·19 | ·1 | | | 80 | 12 | 62· | ·56 | 91 | 74 | |
| 10 | ·23 | ·1 | | | 80 | 12 | 62· | ·56 | 90 | 75 | |
| 11 | ·24 | ·12 | | | 80 | 10 | 65· | ·62 | 92½ | 72 | |
| 12 | ·23 | ·14 | | | 81 | 13 | 61·5 | ·53 | 92 | 72½ | |
| 13 | ·24 | ·12 | | | 81 | 12 | 63· | ·56 | 91 | 69 | |
| 14 | ·26 | ·12 | | | 80 | 11 | 63·5 | ·59 | 90½ | 68½ | |
| 15 | ·24 | ·12 | | | 81 | 11 | 63·5 | ·59 | 93 | 74 | |
| 16 | ·23 | ·1 | | | 80 | 9 | 66 5 | ·65 | 91½ | 75 | |
| 17 | ·20 | ·12 | | | 80 | 8 | 68· | ·68 | 91 | 71 | |
| 18 | ·18 | ·08 | | | 82 | 9 | 68·5 | ·65 | 91 | 72 | |
| 19 | ·22 | 08 | | | 82 | 10 | 67· | ·62 | 89 | 71 | |
| 20 | ·23 | ·1 | | | 80 | 7 | 71·5 | ·71 | 89 | 69 | |
| 21 | ·22 | ·12 | | | 81 | 7 | 71·5 | ·71 | 93 | 72 | |
| 22 | ·21 | ·1 | | | 82 | 9 | 68·5 | ·65 | 93 | 71 | |
| 23 | ·23 | ·1 | | | 83 | 9 | 69·5 | ·65 | 94 | 72 | |
| 24 | ·23 | ·1 | | | 84 | 11 | 67·5 | ·59 | 93 | 73 | |
| 25 | ·25 | ·1 | | | 82 | 13 | 62·5 | ·53 | 96 | 76 | |
| 26 | ·23 | ·1 | | | 83 | 12 | 65· | ·56 | 94 | 75 | |
| 27 | ·24 | ·12 | | | 82 | 12 | 64· | .56 | 95 | 76 | |
| 28 | ·21 | ·1 | | | 83 | 12 | 65· | 59 | 93 | 77 | |
| 29 | ·21 | ·1 | | | 84 | 12 | 66· | 56 | 94 | 80 | |
| 30 | ·18 | ·08 | | | 84 | 11 | 67·5 | 59 | 95 | 79 | |
| 31 | ·19 | ·1 | | | 84 | 10 | 69· | ·62 | 94 | 76 | |
| MONTHLY MEANS. | | | | | | | | | | | |
| | 27·20 | 0·11 | 77·5 | 7·7 | 81·1 | 11·4 | 64·0 | 57·9 | 92·0 | 72·1 | |

CH.

| *Wind.* Whewell's. Horizontal movement in 24 Hours, in Miles | *Wind.* Whewell's. General Direction. | *Rain.* Crossley's. Inches and tenths. | Moon. Phases of. | |
|---|---|---|---|---|
| | | | ☽ | |
| | | | ○ | At 2. P. M. a whirl wind forced the dust into a dense column or pillar 25 feet in height, and about $2\frac{1}{2}$ feet diameter, which was carried, in this way, a distance of 200 yards, when it remained nearly stationary for about 5 minutes; it then travelled in a S. E. direction, gradually losing its entirely, till it was altogether dispersed about 500 yards from the place where it was stationary, direction of whirl from right to left. |
| | | | ☾ | |
| | | | | Very slight Rain. |
| | | 0·025 | | |
| | | | ● | |
| | | 0·005 | ☽ | Slight shower at 2·30 A. M. |
| | | *Total.* 0 030 in 2 Days. | | |

| | Laul Baugh | High Ground |
|---|---|---|
| Mean Monthly Temperature............ | 82·1 | |
| Maximum............................ | 96· | |
| Minimum............................ | 66·5 | |
| Mean diurnal Range.................. | 19·9 | |
| Monthly Range....................... | 29·5 | |
| Mean of observation of Dry Bulb inside House, at 9.30 A. M. & 3.30 P. M. .. | ...... | 79·3 |
| ,, Depression of wet at do do | ...... | 9·5 |
| ,, Dew Point. at do do | ...... | 64·3 |
| ,, Evaporation Force of at do | ...... | ·37 |
| ,, Humidity at do do | ...... | ·63 |

AP

| Month and Date. | *Standard Barometer.* India House on the "High Ground." Means of observations at 9.30 A. M. and 3.30 P.M. | *Standard Thermometers.* Diurnal Range. | Dry Bulb at 9.30 A. M. | Depression of wet, at do. | Dry Bulb at 3.30 P. M. | Depression of wet, at do. | Dew Point from the 3.30 P. M. observations. | Humidity do. | In Verandah of the House of the Supt. of the Govt. Gardens. Max. (Self registering.) | Min. (Self registering.) | Portion of sky clear. O. being all cloud 10 pure Sun shine. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 27·20 | ·08 | | | 83 | 9 | 69·5 | ·65 | 94 | 75 | |
| 2 | ·21 | ·1 | | | 84 | 10 | 69· | ·62 | 95 | 75 | |
| 3 | ·23 | ·1 | | | 85 | 11 | 68·5 | ·59 | 95 | 76 | |
| 4 | ·23 | ·1 | | | 84 | 10 | 69· | ·62 | 93 | 78 | |
| 5 | ·21 | ·1 | | | 85 | 10 | 70· | ·62 | 93 | 76 | |
| 6 | ·19 | ·1 | | | 84 | 8 | 72. | ·68 | 94 | 75 | |
| 7 | ·18 | ·12 | | | 84 | 9 | 70 5 | ·65 | 93 | 74 | |
| 8 | ·17 | ·1 | | | 83 | 7 | 72·5 | ·71 | 92 | 76 | |
| 9 | ·16 | ·12 | | | 83 | 9 | 69·5 | ·65 | 95 | 73 | |
| 10 | ·16 | 08 | | | 83 | 10 | 68· | ·62 | 95 | 72 | |
| 11 | .18 | ·08 | | | 83 | 13 | 63·5 | ·53 | 95 | 74 | |
| 12 | .19 | ·14 | | | 83 | 12 | 65· | ·56 | 95 | 74 | |
| 13 | ·20 | ·12 | | | 82 | 14 | 61· | ·51 | 96 | 75 | |
| 14 | .21 | ·1 | | | 83 | 13 | 63·5 | ·53 | 95 | 76 | |
| 15 | ·21 | ·14 | | | 83 | 12 | 65· | ·56 | 94 | 73 | |
| 16 | ·23 | ·1 | | | 82 | 12 | 64· | ·56 | 95 | 76 | |
| 17 | ·25 | 1 | | | 82 | 12 | 64. | ·56 | 94 | 74 | |
| 18 | ·23 | 1 | | | 83 | 12 | 65· | ·56 | 92 | 77 | |
| 19 | ·24 | ·12 | | | 83 | 12 | 65· | ·56 | 95 | 78 | |
| 20 | ·25 | ·1 | | | 83 | 13 | 63·5 | ·53 | 94 | 75 | |
| 21 | ·26 | ·12 | | | 83 | 18 | 63·5 | ·53 | 93 | 76 | |
| 22 | ·21 | ·1 | | | 82 | 10 | 67· | ·62 | 92 | 75 | |
| 23 | ·17 | ·1 | | | 80 | 7 | 69·7 | ·71 | 89 | 73 | |
| 24 | ·16 | ·12 | | | 79 | 6 | 70· | ·75 | 93 | 76 | |
| 25 | ·20 | ·12 | | | 80 | 7 | 69·5 | ·71 | 92 | 74 | |
| 26 | .21 | ·1 | | | 82 | 9 | 68·5 | ·65 | 94 | 75 | |
| 27 | ·21 | ·1 | | | 83 | 9 | 69 5 | ·65 | 95 | 78 | |
| 28 | ·21 | ·1 | | | 83 | 20 | 53. | ·37 | 97 | 78 | |
| 29 | ·18 | ·12 | | | 84 | 19 | 55·5 | ·39 | 97 | 80 | |
| 30 | ·22 | ·1 | | | 84 | 17 | 58·5 | ·44 | 96 | 79 | |
| MONTHLY MEANS. | | | | | | | | | | | |
| | 27·2 | 0·11 | 78·5 | 5·8 | 82·8 | 11·2 | 66·1 | 58·9 | 94·1 | 75·5 | |

RIL.

| Wind. Whewell's. Horizontal movement in 24 Hours, in Miles. | Wind. Whewell's. General Direction. | Rain. Crossley's. Inches and tenths. | Moon. Phases of. | |
|---|---|---|---|---|
| | | | | Sultry, Rain brewing. |
| | | | ○ | |
| | | | | Dust storm 5 P. M. and a sprinkle of Rain. |
| | | | ☾ | |
| | | | | Dust storm. |
| | | | | Heavy rain in Chicka Ballapoor. |
| | | 0·215 | | Dust storm at 5 P. M. and Rain, Heavy clouds. |
| | | | ● | |
| | | 0·100 | | |
| | | 0·14 | | |
| | | 0·065 | | Dust storm, Thunder and Rain at 4 P. M. |
| | | | ☽ | |
| | | | | Hot wind, very dry and every appearance of a storm. |
| | | | | Do. |
| | | | | Do. |
| | | *Total.* | | |
| | | 0·520 in 4 Days. | | |

From the 16th to 24th heavy falls of Rain all round were reported; apparently, most severe at Hassan.

| | Laul Baugh | High Ground |
|---|---|---|
| Mean Monthly Temperature | 84·8 | |
| Maximum | ·97 | |
| Minimum | ·72 | |
| Mean diurnal Range | 18·5 | |
| Monthly Range | ·25 | |
| Mean of observations of Dry Bulb inside House at 9.30 A. M. and 3 30 P. M. | ...... | 80·6 |
| „ Depression of wet at do do. | ...... | 8·5 |
| „ Dew Point at do do. | ...... | 67·8 |
| „ Evaporation Force of at do. | ...... | ·35 |
| „ Humidity at do do. | ...... | ·65 |

## MAY.

| Month and Date. | Standard Barometer. Inside House on the "High Ground." Mean of observations at 9.30 A. M. and 3.30 P. M. | Diurnal Range. | Standard Thermometers. Dry Bulb at 9.30 A. M. | Depression of wet, at do. | Dry Bulb at 3.30 P. M. | Depression of wet, at do. | Dew Point from the 3.30 P. M. observations. | Humidity do. | In Verandah of the House of the Supt. of the Govt. Gardens. Max. (Self registering.) | Min (Self registering.) | Portion of sky clear O. being all could 10 pure Sun shine. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 27·18 | ·12 | | | 86 | 16 | 62· | ·46 | 95 | 79 | |
| 2 | ·13 | ·1 | | | 85 | 14 | 64· | ·51 | 95 | 77 | |
| 3 | ·13 | ·1 | | | 84 | 11 | 67·5 | ·59 | 94 | 72 | |
| 4 | ·13 | ·1 | | | 83 | 10 | 68· | ·62 | 94 | 73 | |
| 5 | ·13 | ·1 | | | 84 | 11 | 67·5 | ·59 | 95 | 80 | |
| 6 | ·13 | ·1 | | | 83 | 12 | 65· | ·56 | 93 | 75 | |
| 7 | ·15 | ·1 | | | 84 | 13 | 64·5 | ·53 | 93 | 78 | |
| 8 | ·16 | ·12 | | | 84 | 12 | 66· | ·56 | 91 | 75 | |
| 9 | ·14 | ·12 | | | 83 | 13 | 63·5 | ·53 | 95 | 74 | |
| 10 | ·17 | ·1 | | | 83 | 12 | 65· | ·56 | 91 | 76 | |
| 11 | ·15 | ·1 | | | 83 | 11 | 66·5 | ·59 | 93 | 73 | |
| 12 | ·13 | ·1 | | | 83 | 11 | 66·5 | ·59 | 93 | 77 | |
| 13 | ·08 | ·12 | | | 82 | 9 | 68·5 | ·65 | 92 | 75 | |
| 14 | ·10 | ·12 | | | 83 | 11 | 66·5 | ·59 | 92 | 74 | |
| 15 | ·12 | ·12 | | | 83 | 12 | 65· | ·56 | 92 | 73 | |
| 16 | ·10 | ·1 | | | 82 | 11 | 65·5 | ·59 | 92 | 73 | |
| 17 | ·12 | ·1 | | | 83 | 13 | 63·5 | ·53 | 93 | 76 | |
| 18 | ·09 | ·1 | | | 82 | 11 | 65·5 | ·59 | 95 | 77 | |
| 19 | ·05 | ·1 | | | 82 | 11 | 65·5 | ·59 | 93 | 73 | |
| 20 | 26·94 | ·12 | | | 83 | 13 | 63·5 | ·53 | 95 | 77 | |
| 21 | ·88 | ·12 | | | 82 | 11 | 65·5 | ·59 | 91 | 72 | |
| 22 | ·82 | ·08 | | | 81 | 9 | 67 5 | ·65 | 88 | 69 | |
| 23 | ·79 | ·1 | | | 79 | 6 | 70· | ·75 | 88 | 69 | |
| 24 | ·80 | ·08 | | | 78 | 7 | 67·5 | ·71 | 84 | 71 | |
| 25 | ·81 | ·1 | | | 79 | 8 | 67· | ·68 | 87 | 71 | |
| 26 | ·81 | ·06 | | | 79 | 9 | 65·5 | ·65 | 91 | 75 | |
| 27 | ·82 | ·08 | | | 80 | 10 | 65· | ·62 | 93 | 73 | |
| 28 | ·83 | ·1 | | | 79 | 9 | 55·5 | ·65 | 92 | 73 | |
| 29 | ·81 | ·1 | | | 80 | 9 | 66 5 | ·65 | 90 | 74 | |
| 30 | ·83 | ·1 | | | 79 | 9 | 65 5 | ·65 | 92 | 74 | |
| 31 | ·85 | ·1 | | | 80 | 9 | 66·5 | ·65 | 88 | 73 | |
| MONTHLY MEANS. | | | | | | | | | | | |
| | 27.0 | 0.1 | 78. | 7.8 | 82.0 | 10.7 | 65.9 | .60 | 91.9 | 74.2 | |

N. B. From the 20th the Observations of the

| *Wind.* Whewell's. Horizontal movement in 24 Hours, in Miles. | *Wind.* Whewell's. General Direction. | *Rain.* Crossley's. Inches and tenths. | Moon. Phases of. | |
|---|---|---|---|---|
| | | | | On the 1st a Man was killed by lightning at Sheemoogah near the Cutcherry; his companion escaped unhurt, 2 holes, like rat's holes a yard apart, were found near the spot. The deceased's clothes were burnt and the ground was stained with his Blood; A Boy was killed in a Tree, the trunk of which was split; and the leaves burnt. Dr. Oswald states that the lightning at Sheemoogah this month was constant, and of a prevailing violet color, though sometimes yellow, and that the thunder, was coincident with the lightning; he afterwards informed me that the whole year was a peculiar one, and the Seasons later than usual. |
| | | 0·615 | | Hot wind. |
| | | 0·110 | | Dust storm, Thunder storm at night. |
| | | | | Thunder at 3 P. M. and Rain in the Evening. |
| | | 0 015 | ○ | Thunder storm 6 P. M. not much Rain. |
| | | | | Thunder and little rain at 4 P. M. |
| | | 0·060 | } | Continued low rolling thunder at night, little rain in the Evening, two bullocks killed by lightning in House in Davenhully Talook. |
| | | | | High wind, Rain 7 P. M. thunder very continuous. |
| | | 0.090 | ☾ | Thunder and heat drops at 3 P.M. Three Cocoanut trees |
| | | 0·425 | | struck by lightning in Pettah. |
| | | 0·005 | | Thunder and rain 3 P. M. storm at night. |
| | | | | Rain in the afternoon. |
| | | | | Very sultry evening |
| | | 0·190 | | Very sultry all the morning, heavy sand storm 4 P. M. |
| | | 0·165 | | rain in the evening. |
| | | 0·465 | | Dust storm rain in the evening. |
| | | 3·380 | ● | Rain 10 P. M. |
| | | 1 265 | | Smart shower with thunder 6 A. M. and do. at 6 P. M. |
| | | 0·700 | | Steady rain at night. } 3 days supply to Tanks. |
| | | | | do. do. } |
| | | | | Strong westerly breeze; overcast. Thermometer Madras Observatory Maximum, 103. |
| | | | | do. do. 104. |
| | | 0·465 | ☽ | Rain at night. Therm. in Subs. rent at Madras 112. |
| | | 0·325 | | do. and all from the E. this Month |
| | | *Total.* 5.275 in 15 Days. | | |

| | Laul Baugh | High Ground |
|---|---|---|
| Mean Monthly Temperature | 83·1 | |
| Maximum | 95· | |
| Minimum | 69· | |
| Mean diurnal Range | 17·7 | |
| Monthly Range | 26· | |
| Mean of observations of Dry Bulb inside House at 9 30 A. M. and 3.30 P. M. | ...... | 80· |
| ,, Depression of wet at do. do. | ...... | 9·3 |
| ,, Dew Point. at do. do. | ...... | 68· |
| ,, Evaporation Force of at do. | ...... | · |
| ,, Humidity at do. do | ...... | ·68 |

Barometer were more carefully taken than before.

JU

| Month and Date. | Standard Barometer. Inside House on the "High Ground." Mean of observations at 9.30 A. M. and 3.30 P. M. | Diurnal Range. | Standard Thermometers. Dry Bulb at 9.30 A. M. | Depression of wet, at do. | Dry Bulb at 3.30 P. M. | Depression of wet, at do. | Dew Point from the 3.30 P. M. observations. | Humidity do. | In Verandah of the House of the Supt. of the Govt. Gardens. Max. (Self registering.) | Min. (Self registering.) | Portion of sky clear. O. being all cloud 10 pure Sun shine. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 26·88 | ·08 | | | 80 | 10 | 65· | ·62 | 91 | 74 | |
| 2 | ·89 | ·1 | | | 80 | 9 | 66·5 | ·65 | 90 | 71 | |
| 3 | ·82 | ·08 | | | 81 | 11 | 64·5 | ·59 | 90 | 75 | |
| 4 | ·80 | ·08 | | | 80 | 9 | 66 5 | ·65 | 87 | 70 | |
| 5 | ·79 | ·1 | | | 80 | 8 | 68· | ·68 | 88 | 69 | |
| 6 | ·80 | ·12 | | | 80 | 9 | 66·5 | ·65 | 86 | 72 | |
| 7 | ·79 | ·10 | | | 79 | 8 | 67· | ·68 | 82 | 71 | |
| 8 | ·73 | ·14 | | | 78 | 8 | 66· | ·68 | 84 | 70 | |
| 9 | ·71 | ·1 | | | 76 | 4 | 70· | ·82 | 77 | 69 | |
| 10 | ·73 | ·1 | | | 76 | 4 | 70· | ·82 | 76 | 69 | |
| 11 | ·72 | ·08 | | | 75 | 4 | 69· | ·82 | 80 | 68 | |
| 12 | ·74 | ·08 | | | 76 | 4 | 70· | ·82 | 82 | 70 | |
| 13 | ·76 | ·08 | | | 76 | 4 | 70· | ·82 | 82 | 70 | |
| 14 | ·82 | ·08 | | | 76 | 5 | 68·5 | ·78 | 82 | 68 | |
| 15 | ·81 | ·1 | | | 76 | 7 | 65·5 | ·71 | 83 | 69 | |
| 16 | ·78 | ·08 | | | 76 | 8 | 64· | ·68 | 84 | 70 | |
| 17 | ·76 | ·08 | | | 77 | 9 | 63 5 | ·64 | 84 | 69 | |
| 18 | ·77 | ·1 | | | 77 | 8 | 65· | ·68 | 85 | 71 | |
| 19 | ·76 | ·12 | | | 75 | 6 | 66· | ·75 | 84 | 69 | |
| 20 | ·78 | ·12 | | | 75 | 5 | 67·5 | ·78 | 84 | 72 | |
| 21 | .75 | ·1 | | | 76 | 5 | 68·5 | ·78 | 84 | 70 | |
| 22 | ·78 | ·08 | | | 75 | 5 | 67.5 | ·78 | 81 | 70 | |
| 23 | ·78 | ·12 | | | 76 | 6 | 67· | ·75 | 85 | 72 | |
| 24 | ·84 | ·08 | | | 77 | 8 | 65· | ·68 | 86 | 73 | |
| 25 | ·86 | ·08 | | | 77 | 9 | 63·5 | ·64 | 84 | 68 | |
| 26 | ·84 | ·08 | | | 77 | 10 | 62· | ·61 | 82 | 70 | |
| 27 | ·87 | ·1 | | | 77 | 9 | 63·5 | ·64 | 83 | 71 | |
| 28 | ·85 | ·1 | | | 75 | 5 | 67·5 | ·78 | 84 | 68 | |
| 29 | ·84 | ·12 | | | 75 | 6 | 66· | ·75 | 86 | 67 | |
| 30 | ·80 | ·22 | | | 74 | 5 | 66 5 | ·78 | 80 | 69 | |

MONTHLY MEANS.

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 26·8 | 0·1 | 73·5 | 4·5 | 77·0 | 6·9 | 66·5 | ·72 | 83·0 | 70·1 | |

NE.

| *Wind.* Whewell's. Horizontal movement in 24 Hours, in Miles. | *Wind.* Whewell's. General Direction. | *Rain* Crossley's Inches and tenths. | Moon. Phases of. | |
|---|---|---|---|---|
| | | 9·095 | | |
| | | 0·005 | | Thunder and little rain about 4 P. M. |
| | | | ○ | |
| | | | | Wind variable and gradually veering to the west. |
| | | 0·090 | | |
| | | | | 1st Day of S. W. Moonsoon at Ootacamund. |
| | | 0·005 | | |
| | | 0·515 | | Rain during afternoon. |
| | | 0·010 | | Little rain do. |
| | | | ☾ | |
| | | 0 280 | | Rain in afternoon. |
| | | 0.010 | | do. |
| | | | | Very High Wind. |
| | | | | do. |
| | | | | do. |
| | | 0·040 | | Three Months supply in Northern Talooks. |
| | | 1·645 | ● | Rain at night, 1 Month supply to tanks about Bangalore. |
| | | | ☽ | |
| | | 0·295 | | Smart shower in the afternoon. |
| | | 0·005 | | Little rain in the afternoon. |
| | | 0·040 | | Little rain in the morning. |
| | | *Total.* | | |
| | | 3·055 in 13 Days. | | |

| | Laul Baugh | High Ground |
|---|---|---|
| Mean Monthly Temperature. | 77· | |
| Maximum.. | 91· | |
| Minimum | 68· | |
| Mean diurnal Range | 13·8 | |
| Monthly Range | 23· | |
| Mean of observations of dry Bulb inside House at 9.30 A. M. and 3.30 P. M. | ..... | 75 2 |
| ,, Depression of wet at do. do. | ...... | 5·7 |
| ,, Dew Point. at do. do. | ...... | 66·7 |
| ,, Evaporation Force of at do. | ...... | |
| ,, Humidity at do. do. | ...... | ·76 |

| Month and Date. | Standard Barometer. Mean of observations at 9.30 A. M. and 3.30 P. M. | Diurnal Range. | Standard Thermometers. Inside House on the "High Ground." Dry Bulb at 9.30 A. M. | Depression of wet, at do. | Dry Bulb at 3 30 P. M. | Depression of wet, at do. | Dew Point from the 3·30 P. M. observations. | Humidity do. | In Verandah of the House of the Supt. of the Govt. Gardens Max. (Self registering.) | Min. (Self registering.) | Portion of sky clear. O. being all cloud 10 pure Sun shine. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 26·77 | ·1 | | | 75 | 5 | 67·5 | ·78 | 79 | 69 | |
| 2 | ·75 | ·1 | | | 75 | 6 | 66· | ·75 | 81 | 70 | |
| 3 | ·76 | ·08 | | | 76 | 8 | 64· | ·68 | 82 | 70 | |
| 4 | ·78 | ·08 | | | 76 | 7 | 65·5 | ·71 | 82 | 70 | |
| 5 | ·80 | ·08 | | | 76 | 8 | 64· | ·68 | 82 | 69 | |
| 6 | ·83 | ·06 | | | 77 | 10 | 62· | ·61 | 83 | 69 | |
| 7 | ·85 | ·06 | | | 76 | 8 | 64· | ·68 | 80 | 69 | |
| 8 | ·86 | ·08 | | | 75 | 8 | 63· | ·68 | 83 | 68½ | |
| 9 | ·87 | ·1 | | | 76 | 10 | 61· | ·61 | 81 | 68 | |
| 10 | .85 | ·1 | | | 76 | 9 | 62·5 | ·64 | 82 | 68 | |
| 11 | .83 | ·1 | | | 75 | 8 | 63· | ·68 | 78 | 67 | |
| 12 | ·81 | ·1 | | | 75 | 7 | 64 5 | ·71 | 77 | 68 | |
| 13 | ·79 | ·1 | | | 75 | 6 | 66· | ·75 | 79 | 69 | |
| 14 | ·77 | ·1 | | | 74 | 5 | 66 5 | ·78 | 81 | 68 | |
| 15 | ·75 | ·1 | | | 75 | 7 | 64·5 | ·71 | 80 | 68 | |
| 16 | ·77 | ·1 | | | 74 | 7 | 63·5 | ·71 | 77 | 68 | |
| 17 | ·79 | ·1 | | | 76 | 9 | 62 5 | ·64 | 82 | 69 | |
| 18 | ·81 | ·1 | | | 77 | 10 | 62· | ·61 | 84 | 70 | |
| 19 | ·81 | ·1 | | | 77 | 11 | 60 5 | ·58 | 83 | 67 | |
| 20 | ·82 | ·1 | | | 77 | 10 | 62· | ·61 | 84 | 71 | |
| 21 | ·81 | .1 | | | 76 | 8 | 64· | ·68 | 83 | 69 | |
| 22 | ·80 | ·08 | | | 76 | 8 | 64· | ·68 | 83 | 69 | |
| 23 | ·80 | ·08 | | | 76 | 8 | 64· | ·68 | 84 | 68 | |
| 24 | ·80 | ·1 | | | 75 | 9 | 61·5 | ·64 | 81 | 69 | |
| 25 | ·81 | ·1 | | | 76 | 9 | 62·5 | 64 | 82 | 68 | |
| 26 | ·80 | ·1 | | | 75 | 8 | 63· | ·68 | 80 | 70 | |
| 27 | ·81 | ·08 | | | 72 | 4 | 66· | ·82 | 75 | 67 | |
| 28 | ·81 | ·1 | | | 73 | 5 | 65·5 | ·78 | 74 | 68 | |
| 29 | ·80 | ·1 | | | 75 | 7 | 62·5 | ·71 | 81 | 67 | |
| 30 | ·81 | ·1 | | | 75 | 7 | 62·5 | ·71 | 83 | 69 | |
| 31 | 82 | ·08 | | | 75 | 8 | 61· | ·68 | 81 | 69 | |
| MONTHLY MEANS. | | | | | | | | | | | |
| | 26·8 | 0·09 | 72·3 | 4·7 | 75·4 | 7·7 | 63·6 | ·69 | 80·9 | 68·7 | |

LY.

| Wind. Whewell's. Horizontal movement in 24 Hours, in Miles. | Wind. Whewell's. General Direction | Rain. Crossley's Inches and tenths. | Moon. Phases of. | | Deaths by Cholera in Cantonment. European. | Deaths by Cholera in Cantonment. Native. |
|---|---|---|---|---|---|---|
| 4 | s. s. w. | 0·20 | | Little Rain in afternoon. | | |
| 60 | ,, | 0·020 | ○ | | | |
| 44 | s. by w | | | | | |
| 60 | s. s. w. | | | | | |
| 56 | ,, | | | | | |
| 68 | w. s. w. | | | | | |
| 72 | s.wbyw | | | Very High Wind. | | |
| 56 | ,, | | | do. | | |
| 80 | ,, | | | Cholera commenced in the Cantonment. | 1 | |
| 72 | ,, | | ☾ | | | |
| 76 | w. s. w. | 0 040 | | | | |
| 76 | ,, | 0·035 | | Little rain at Night. | | 1 |
| 44 | ,, | 0·230 | | do. | | |
| 60 | ,, | 0·050 | | do. | 1 | 6 |
| 68 | s.wbyw | 0 070 | | | ...... | 3 |
| 48 | ,, | 0·035 | | | ...... | 2 |
| 72 | ,, | | | | ...... | 2 |
| 48 | ,, | 0·110 | ● | | ..... | 14 |
| 60 | ,, | | | | .... | 16 |
| 20 | ,, | | | Little rain Evening. | ...... | 11 |
| 60 | w.s. w. | 0 075 | | Rain. 2. A. M. | 2 | 9 |
| 76 | ,, | | | Very high wind occasionally almost due South, all this month. Sky generally overcast heavy rain often threatened but rarely fell, Cholera broke out severely into Cantonment but mildly in the Pettah; It was severe in the Baithmanglum, Colar, Moolwagle and Baigoor Talooks. In many Talooks of this Division the Raggy has not yet been sown; and what was sown, has withered from the drought. | | 28 |
| 40 | ,, | 0·235 | | | 1 | 9 |
| 40 | ,, | | | | | 17 |
| 72 | ,, | 0·005 | ☽ | | I | 19 |
| 80 | ,, | 0·005 | | | | 20 |
| 132 | ,, | | | | 2 | 48 |
| 88 | ,, | | | | | 58 |
| 20 | ,, | | | | | |
| 20 | s.w. | | · | | | |
| 16 | ,, | | | *Total.* | 8 | 263 |
| | | *Total.* 1·110 | in 13 Days. | | | |

| | Laul Baugh | High Ground |
|---|---|---|
| Mean Monthly Temperature... ........ | 74·8 | |
| Maximum........ ........ ........ | 84· | |
| Minimum.......... ... .. ......... .... | 67· | |
| Mean diurnal Range.... ...... ........ | 12·2 | |
| Monthly Range ..... .... ......... .... | 17· | |
| Mean of observation of Dry Bulb inside-House, at 9 30 A. M. & 3.30 P. M. ...... | ...... | 73 8 |
| ,, Depression of wet at do. do. | ...... | 6·2 |
| ,, Dew Point. at do. do. | ...... | 65· |
| ,, Evaporation Force of at do. | ...... | |
| ,, Humidity at do. do. | ...... | ·75 |

AU

| Month and date. | Standard Barometer. Mean of Observations at 9.30 A. M. and 3.30 P. M. | Diurnal Range. | Standard Thermometers. Inside House on the "High Ground." Dry Bulb at 9.30 A. M. | Depression of wet, at do. | Dry Bulb at 3.30 P. M. | Depression of wet, at do. | Dew Point from the 3.30 P. M. observations. | Humidity do. | In Verandah of the House of the Supt. of the Govt. Gardens. Max. (Self registering.) | Min. (Self registering.) | Portion of sky clear. O. being all cloud 10 pure Sun shine. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 26·82 | .08 | | | 75 | 7 | 64·5 | ·71 | 80 | 70 | |
| 2 | ·82 | .08 | | | 74 | 7 | 63.5 | ·71 | 81 | 68 | |
| 3 | ·81 | ·1 | | | 75 | 7 | 64·5 | ·71 | 80 | 69 | |
| 4 | ·81 | ·1 | | | 75 | 7 | 61 5 | ·71 | 81 | 67 | |
| 5 | ·79 | ·1 | | | 74 | 6 | 65· | .75 | 79 | 68 | |
| 6 | ·79 | ·1 | | | 74 | 5 | 66·5 | ·78 | 81 | 68 | |
| 7 | ·78 | .08 | | | 75 | 8 | 63· | ·68 | 81 | 67 | |
| 8 | ·80 | ·08 | | | 75 | 7 | 64·5 | ·71 | 83 | 67 | |
| 9 | ·85 | ·1 | | | 75 | 6 | 66· | ·75 | 86 | 69 | |
| 10 | ·85 | ·1 | | | 76 | 8 | 64· | ·68 | 89 | 71 | |
| 11 | ·84 | ·12 | | | 76 | 8 | 64· | ·68 | 86 | 69 | |
| 12 | ·78 | ·12 | | | 77 | 8 | 65· | ·68 | 85 | 68 | |
| 13 | ·79 | ·06 | | | 76 | 7 | 65 5 | ·71 | 81 | 67 | |
| 14 | ·81 | ·06 | | | 75 | 6 | 66· | ·75 | 82 | 67 | |
| 15 | ·83 | ·1 | | | 76 | 8 | 64· | ·68 | 84 | 70 | |
| 16 | ·81 | ·1 | | | 77 | 8 | 65· | ·68 | 82 | 68 | |
| 17 | ·79 | ·1 | | | 76 | 6 | 67· | ·75 | 83 | 69 | |
| 18 | ·81 | ·1 | | | 75 | 5 | 67·5 | ·78 | 82 | 70 | |
| 19 | ·84 | ·12 | | | 74 | 4 | 68· | ·82 | 82 | 68 | |
| 20 | ·84 | ·08 | | | 77 | 6 | 68· | ·75 | 84 | 67 | |
| 21 | ·85 | ·14 | | | 76 | 4 | 71· | ·82 | 85 | 70 | |
| 22 | ·84 | ·12 | | | 76 | 4 | 71· | ·82 | 82 | 72 | |
| 23 | ·86 | ·08 | | | 76 | 5 | 68·5 | ·78 | 82 | 71 | |
| 24 | ·87 | ·1 | | | 76 | 4 | 71· | ·82 | 79 | 68 | |
| 25 | ·89 | ·1 | | | 76 | 4 | 71· | ·82 | 81 | 68 | |
| 26 | ·89 | ·1 | | | 76 | 5 | 68·5 | ·78 | 81 | 67 | |
| 27 | ·91 | ·1 | | | 76 | 4 | 71· | ·82 | 85 | 69 | |
| 28 | ·90 | ·12 | | | 75 | 4 | 69· | ·82 | 80 | 70 | |
| 29 | ·88 | .12 | | | 74 | 2 | 71· | ·91 | 80 | 69 | |
| 30 | ·85 | .1 | | | 73 | 2 | 70· | ·91 | 81 | 70 | |
| 31 | ·83 | ·1 | | | 73 | 3 | 68·5 | ·86 | 79 | 70 | |
| MONTHLY MEANS. | | | | | | | | | | | |
| | 26·8 | 00·9 | 72·5 | 4·3 | 75·3 | 5·6 | 6·7 | 82·2 | 80·0 | 68 7 | |

GUST.

| Wind. Whewell's. Horizontal movement in 24 Hours in Miles. | Wind. Whewell's. General Direction. | Rain. Crossley's. Inches and tenths. | Moon. Phases of. | | Deaths by Cholera in Cantonment. European. | Deaths by Cholera in Cantonment. Native. |
|---|---|---|---|---|---|---|
| 40 | w.s.w. | | ○ | | 4 | 56 |
| 60 | w.bys. | | | | 10 | 65 |
| 76 | ,, | | | Very high wind. | 2 | 23 |
| 92 | ,, | | | Do. | 1 | 15 |
| 104 | ,, | 0·065 | | Rain 3 P. M. | 1 | 30 |
| 80 | ,, | 0·190 | | Do. | 1 | 22 |
| 44 | w. | | | | 1 | 24 |
| 76 | w.bys. | | | | 1 | 31 |
| 92 | w.s.w. | | | | | 19 |
| 54 | ,, | | ☾ | | | 12 |
| 40 | w. | 0·005 | | Smart shower from 5 to 6 P. M. | | 7 |
| 68 | ,, | 0·320 | | | | 11 |
| 76 | ,, | 0·050 | | | | 4 |
| 80 | ,, | | | | | 5 |
| 72 | ,, | | | | 1 | 18 |
| 64 | ,, | 0 030 | | Smart shower 5. P. M. } Wind variable. | 1 | 7 |
| 48 | ,, | 0·025 | ● | } | | 4 |
| 20 | w.NW. | 0 870 | | } | | 1 |
| 24 | ,, | 0·295 | | Rain 3 P. M. & during night. } | | 4 |
| 8 | ,, | | | Heavy rain 3. P. M. | 1 | 1 |
| 4 | ,, | | | | | 4 |
| 4 | ,, | 0.330 | ☽ | Rain 5· P. M. | | 6 |
| 8 | N. W. | 0 680 | | Do. and night. | | 7 |
| 4 | ,, | 0·145 | | Do. | | 4 |
| 32 | ,, | 1.925 | | Do. | | 1 |
| 8 | w.Nw. | 2.265 | | Heavy rain P. M. and during night. | | 4 |
| 12 | N. w. | 0.035 | | Do. | | 4 |
| 4 | w.s w. | 1.085 | | Do. | 2 | 2 |
| 72 | w.by.s | 0 153 | | Do. } Wind remarkably steady; | | 0 |
| 40 | w.by.s | 0.440 | | Do. } These very high winds | 1 | 0 |
| 48 | w.by.s | 0.305 | ○ | Do. } generally only blow from | | |
| | | | | Do. } about 6 A. M. to 5 P. M. | | |
| | | | | *Total.* | 23 | 392 |

| | | *Total.* |
|---|---|---|
| | | 9·215 in 19 Days. |

| | Laul Baugh | High Ground |
|---|---|---|
| Mean Monthly Temperature ............ | 75 5 | |
| Maximum.... ................ ....... | 89· | |
| Minimum. ........................... | 67· | |
| Mean diurnal Range.................. | 13·5 | |
| Monthly Range...................... | 22· | |
| Mean of observations of Dry Bulb inside House at 9.30 A. M. & 3.30 P. M.... | ...... | 73·9 |
| ,, Depression of wet at do. do. | .... . | 5· |
| ,, Dew Point. at do. do. | ...... | 66 5 |
| ,, Evaporation Force of at do. | ..... | |
| ,, Humidity. at do. do. | ...... | ·78 |

## SEPTEM

| Month and Date. | Standard Barometer. Inside House on the "High Ground." Means of observations at 9.30 A.M. and 3.30 P.M. | Diurnal Range. | Standard Thermometers. Dry Bulb at 9.30 A.M. | Depression of wet, at do. | Dry Bulb at 3·30 P.M. | Depression of wet, at do. | Dew Point from the 3.30 P.M. observations. | Humidity do. | In Verandah of the House of the Supt. of the Govt. Gardens. Max. (Self registering.) | Min. (Self registering. | Portion of sky clear. O. being all cloud 10 pure Sun shine. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 26·81 | ·1 | | | 74 | 5 | 66·5 | ·78 | 81 | 70 | 3 |
| 2 | ·81 | ·1 | | | 74 | 6 | 65· | ·75 | 79 | 69 | 3 |
| 3 | 79 | ·1 | | | 74 | 5 | 66 5 | .78 | 77 | 67 | 4 |
| 4 | ·81 | ·1 | | | 74 | 6 | 65· | ·75 | 77 | 66 | 3 |
| 5 | ·81 | ·1 | | | 74 | 6 | 65. | ·75 | 78 | 67 | 4 |
| 6 | ·83 | ·1 | | | 75 | 6 | 66· | ·75 | 80 | 68 | 4 |
| 7 | ·85 | ·1 | | | 75 | 6 | 66· | ·75 | 82 | 69 | 3 |
| 8 | ·82 | ·12 | | | 75 | 5 | 67·5 | ·78 | 81 | 71 | 3 |
| 9 | .82 | .12 | | | 76 | 5 | 68·5 | ·78 | 83 | 70 | 4 |
| 10 | ·86 | ·12 | | | 75 | 5 | 67 5 | ·78 | 80 | 68 | 3 |
| 11 | ·88 | ·12 | | | 75 | 4 | 69. | ·82 | 81 | 69 | 5 |
| 12 | ·86 | ·12 | | | 75 | 4 | 69· | ·82 | 81 | 71 | 4 |
| 13 | ·84 | ·12 | | | 74 | 3 | 69·5 | ·86 | 80 | 67 | 5 |
| 14 | 86 | ·12 | | | 73 | 3 | 68 5 | ·86 | 80 | 68 | 4 |
| 15 | ·84 | ·12 | | | 73 | 3 | 68·5 | ·86 | 80 | 68 | 3 |
| 16 | ·83 | ·1 | | | 74 | 5 | 66·5 | ·78 | 77 | 67 | 5 |
| 17 | ·84 | ·08 | | | 74 | 5 | 66,5 | ·78 | 77 | 67 | 5 |
| 18 | ·85 | ·1 | | | 74 | 6 | 65, | ·75 | 78 | 67 | 4 |
| 19 | ·85 | ·06 | | | 74 | 6 | 65· | .75 | 77 | 68 | 2 |
| 20 | ·87 | ·1 | | | 76 | 9 | 62·5 | ·64 | 81 | 69 | 5 |
| 21 | ·89 | ·1 | | | 75 | 8 | 63· | ·68 | 82 | 68 | 7 |
| 22 | ·89 | ·1 | | | 76 | 9 | 62·5 | ·64 | 83 | 71 | 8 |
| 23 | ·86 | ·12 | | | 77 | 10 | 62· | ·61 | 82 | 70 | 8 |
| 24 | ·88 | ·12 | | | 76 | 10 | 61· | ·61 | 82 | 71 | 7 |
| 25 | ·86 | ·12 | | | 76 | 9 | 62·5 | ·64 | 82 | 72 | 4 |
| 26 | ·81 | ·1 | | | 77 | 9 | 63 5 | ·64 | 83 | 69 | 2 |
| 27 | .79 | ·1 | | | 76 | 7 | 65·5 | ·71 | 77 | 68 | 0 |
| 28 | ·80 | .08 | | | 76 | 7 | 65·5 | ·71 | 77 | 67 | 1 |
| 29 | ·83 | .1 | | | 76 | 8 | 64. | ·68 | 82 | 67 | 8 |
| 30 | .82 | ·08 | | | 76 | 9 | 62.5 | ·64 | 84 | 71 | 9 |
| MONTHLY MEANS. | | | | | | | | | | | |
| | 26·8 | 0·10 | 71·5 | 3·7 | 75·0 | 6·3 | 65·5 | ·74 | 80·1 | 68·7 | 4 3 |

BER.

| | European & Eurosians. | Natives. |
|---|---|---|
| N. B. Total Deaths by cholera in Cantonment from 10th July to 30th September, 1861. | 31. | 690. |
| Do. in Bangalore Pettah during same period. | 0 | 106. |
| Do in Talooks of the Bangalore Division. | 0 | 656. |
| *Total.* | 31 | 1361 |

| Wind. Whewell's. Horizontal movement in 24 Hours in Miles. | Wind. Whewell's. General Direction | Rain. Crossley's. Inches and tenths. | Moon. Phases of. | | Deaths by Cholera in Cantonment. European. | Deaths by Cholera in Cantonment. Native. |
|---|---|---|---|---|---|---|
| 20 | w. | 0·625 | | The rain fell before Sun rise. | | |
| 32 | w.s.w | ,, | | Heavy and continued rain from 4 to 6 P. | ,, | 4 |
| 28 | w.bys. | 1·640 | | M. and little during night. | ,, | |
| 60 | W.s w. | ,, | | Slight shower 4 P. M. | ,, | 5 |
| 68 | s. w. | ,, | | | ,, | 1 |
| 68 | w.s w. | 0·015 | | Slight shower 4 P. M, | ,, | 2 |
| 40 | w. | 0 005 | | Do. 3 P. M. | ,, | 5 |
| 32 | w.bys. | ,, | ☾ | Thunder 5 P. M. | ,, | 1 |
| 24 | w.s.w. | 0 055 | | After noon showery ; very heavy rain, with | ,, | 1 |
| 32 | s. w. | 1·580 | | thunder and lighting from 6 to 6.30 P. M. | ,, | |
| 48 | w. | 0 270 | | Do. do. from 8 to 8.30 P. M. | ,, | |
| | w.N.w | ,, | | | ,, | |
| | ,, | 1·105 | | Rain in afternoon. | ,, | |
| | w. | 1.670 | ● | Very heavy rain about 5. P. M. 1. 20 in- | ,, | 3 |
| | w. | 0 035 | | ches fell in 15 Minutes guaged by 4 instru- | ,, | 4 |
| | w.byN | 0.455 | | ments. | ,, | |
| | W.N.w | 0 045 | | Showery, commencing at noon, (high | ,, | 1 |
| | w.byN | 0·010 | | wind previously ) | ,, | |
| 44 | w. | ,, | | Little rain evening. | ,, | |
| 12 | W.N.W | ,, | | Showery commencing 9. A. M. | ,, | |
| 40 | ,, | ,, | | Shower in afternoon· | ,, | |
| 4 | ,, | 0·005 | ☽ | Do. | ,, | 2 |
| 32 | N.N.w | 0 010 | | Do. | ,, | |
| 32 | N. w. | ,, | | Do. | ,, | |
| 24 | ,, | 0·025 | | Clouding over to the Eastward. | ,, | |
| 12 | ,, | 1·955 | | Heavy rain from 8 to 10. P. M. with | ,, | |
| 8 | w.N.w | 0·015 | | short intervals. | ,, | 3 |
| 52 | w. | ,, | | Smart showers during afternoon. | ,, | 1 |
| 64 | ,, | ,, | | Wind variable inclining to East. | ,, | |
| 16 | ,, | ,, | ○ | Heavy dew. | ,, | |
| | | | | Hot and sultry. | ,, | 1 |
| | | | | *Total.* | | 35 |

| | | *Total* | | Laul Baugh | High Ground |
|---|---|---|---|---|---|
| | | 9·550 in 18 Days. | Mean Monthly Temperature............ | 74·4 | |
| | | | Maximum. ............................ | 84· | |
| | | | Minimum, ............................ | 66· | |
| | | | Mean diurnal Range.................. | 11·4 | |
| | | | Monthly Range....................... | 18 | |
| | | | Mean of observations of dry Bulb inside House at 9.30 A. M. & 3.30 P. M. .. | ...... | 73·3 |
| | | | ,, Depression of wet at do do | ... .. | 5· |
| | | | ,, Dew point. at do do | ...... | 65· |
| | | | ,, Evaporation Force of at do do | ...... | ·19 |
| | | | ,, Humidity at do do | .. ... | ·78 |

OCTO

| Month and Date. | Standard Barometer. Inside House on the "High Ground." Mean of observations at 9·30 A. M. and 3.30 P. M. | Standard Thermometers. Diurnal Range. | Dry Bulb at 9·30 A. M. | Depression of wet, at do. | Dry Bulb at 3·30 P. M. | Depression of wet, at do. | Dew Point from the 3·30 P. M. observations. | Humidity do. | In Verandah of the House of the Supt. of the Govt. Gardens. Max. (Self registering.) | Min. (Self registering.) | Portion of sky clear. O being all cloud 10 pure Sun shine. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 26 82 | ·08 | | | 77 | 7 | 66·5 | ·71 | 83 | 72 | 8 |
| 2 | ·84 | ·08 | | | 77 | 8 | 65· | ·68 | 81 | 71 | 3 |
| 3 | ·87 | ·1 | | | 77 | 7 | 66·5 | ·71 | 85 | 73 | 7 |
| 4 | ·88 | ·12 | | | 77 | 6 | 68· | ·75 | 86 | 71 | 8 |
| 5 | ·90 | ·12 | | | 77 | 5 | 69·5 | ·79 | 82 | 70 | 7 |
| 6 | ·92 | ·12 | | | 76 | 5 | 68·5 | ·78 | 84 | 68 | 7 |
| 7 | ·94 | ·12 | | | 75 | 5 | 67·5 | ·78 | 81 | 69 | 7 |
| 8 | ·96 | ·12 | | | 75 | 6 | 66· | ·75 | 80 | 72 | 1 |
| 9 | ·91 | ·1 | | | 76 | 8 | 64· | ·68 | 82 | 71 | 9 |
| 10 | ·89 | ·1 | | | 77 | 12 | 59· | ·56 | 83 | 70 | 8 |
| 11 | ·87 | ·1 | | | 77 | 11 | 60·5 | ·58 | 90 | 72 | 8 |
| 12 | ·89 | ·1 | | | 77 | 11 | 60·5 | ·58 | 85 | 70 | 9 |
| 13 | ·91 | ·1 | | | 77 | 9 | 63·5 | ·64 | 85 | 72 | 8 |
| 14 | ·90 | ·12 | | | 77 | 8 | 65· | ·68 | 84 | 71 | 8 |
| 15 | ·88 | ·12 | | | 76 | 7 | 65·5 | ·71 | 83 | 71 | 8 |
| 16 | ·86 | ·12 | | | 75 | 5 | 67·5 | ·78 | 85 | 72 | 5 |
| 17 | ·89 | ·1 | | | 75 | 5 | 67·5 | ·78 | 83 | 70 | 8 |
| 18 | ·85 | ·1 | | | 76 | 6 | 67· | ·75 | 80 | 72 | 2 |
| 19 | ·84 | ·08 | | | 75 | 5 | 67·5 | ·78 | 75 | 69 | 0 |
| 20 | 81 | 1 | | | 73 | 3 | 68.5 | ·86 | 73 | 68 | 0 |
| 21 | ·77 | ·1 | | | 70 | 2 | 67· | ·91 | 70 | 60 | 0 |
| 22 | ·77 | ·1 | | | 67 | 2 | 33·4 | ·32 | 69 | 65 | 0 |
| 23 | ·77 | ·1 | | | 70 | 3 | 65·5 | ·86 | 76 | 69 | 1 |
| 24 | ·76 | ·12 | | | 72 | 3 | 67·5 | ·86 | 81 | 61 | 4 |
| 25 | ·85 | ·1 | | | 75 | 6 | 66· | ·75 | 83 | 71 | 8 |
| 26 | ·87 | ·1 | | | 75 | 8 | 63· | ·68 | 84 | 69 | 9 |
| 27 | ·88 | ·12 | | | 76 | 7 | 65·5 | 71 | 80 | 68 | 8 |
| 28 | ·89 | ·1 | | | 77 | 12 | 59· | ·56 | 85 | 68 | 10 |
| 29 | ·89 | ·1 | | | 76 | 10 | 61· | 61 | 81 | 69 | 5 |
| 30 | ·88 | ·12 | | | 77 | 12 | 59· | ·56 | 81 | 71 | 8 |
| 31 | ·91 | ·1 | | | 76 | 10 | 61· | .61 | 79 | 66 | 9 |
| MONTHLY MEANS. | | | | | | | | | | | |
| | 26 9 | 0·1 | 72·7 | 4·2 | 75·2 | 6 9 | 63·9 | ·70 | 81·3 | 69·6 | 5·9 |

BER.

| Wind. Whewell's. Horizontal movement in 24 Hours, in Miles. | Wind. Whewell's. General Direction. | Rain. Crossley's. Inches and tenths. | Moon. Phases of. | |
|---|---|---|---|---|
| 24 | W. | | | Thunder and Lightning from 4 to 10 P. M. and heavy clouds to the West ward. |
| 16 | N.N. W | | | Thunder and Lightning in afternoon and evening from N. E. few drops of rain at 6. P. M. |
| 16 | W. | | | Do. with rain 8. P. M. from Southward very sultry. |
| 8 | W. | | | Very sultry, rain at night. |
| 12 | W. S. W. | 0·940 | | Do. Lightning all round; Rain in showers from 10 P. M. to 4. A. M. of the 7th. |
| 8 | ,, | 0·900 | | Sultry and oppressive, showery afternoon, lightning all round at night, and rain. |
| 16 | W. | 0·775 | ○ | Steady rain from 6 to 7. A. M. |
| 20 | W. N. W | 0·015 | | Lightning to the Eastward in the evening; wind shifting |
| 32 | N. N. W | | | 1st day of North East Monsoon. |
| 28 | N. | | | Lightning all round. |
| 16 | N N. E. | | | Do. |
| 8 | S. E. | | | Very sultry rain at night. |
| 28 | ,, | | | Slight showers in the morning, Lightning in evening. |
| 8 | ,, | | ● | Do. morning and afternoon. |
| 12 | ,, | 0·035 | | Heavy shower during night. |
| 32 | ,, | 0·175 | | Slight showers from 6 A. M. to noon. |
| 62 | ,, | | | Drizzle all day. |
| 44 | ,, | 0·030 | | Heavy and steady rain from 6.30 to 8.30 A. M. |
| 20 | E. S. E. | 0·075 | | Rain in Morning. Heavy rain at night. |
| 4 | E. | 0·020 | | Slight rain in morning. |
| 32 | N E. | 0·435 | ☾ | Do. heavy rain afternoon and night. |
| 16 | E. N. E. | 0·055 | | |
| 12 | E. | ,, | | Little rain in evening. |
| 20 | S. E. | 0·595 | | Do. |
| 28 | S. E. | 0·005 | | |
| 36 | S. S. E | 0·015 | | |
| 4 | S. E. | 0·295 | | Fog; the 1st "cold weather" morning. |
| 4 | E. | ,, | | |
| 4 | E. N. E. | ,, | | |
| 16 | N. | ,, | | |
| 12 | N. | ,, | ☽ | |
| | Total. | 4·465 in 15 Days. | | |

| | Laul Baugh | High Ground |
|---|---|---|
| Mean Monthly Temperature............ | 75·4 | |
| Maximum............ | ·90 | |
| Minimum............ | ·60 | |
| Mean diurnal Range............ | 11·7 | |
| Monthly Range............ | ·30 | |
| Mean of observations of Dry Bulb inside House at 9.30 A. M. and 3 30 P. M.... | ...... | 73·9 |
| ,, Depression of wet at do do... | ...... | 5·6 |
| ,, Dew Point at do do... | ...... | 65·7 |
| ,, Evaporation Force of at do... | ...... | ·19 |
| ,, Humidity at do do... | ...... | ·76 |

NOVEM

| Month and Date. | Standard Barometer. Inside House on the "High Ground." Means of observations at 9.30 A.M. and 3 30 P.M. | Diurnal Range. | Standard Thermometers. Dry Bulb at 9.30 A.M. | Depression of wet, at do. | Dry Bulb at 3.30 P.M. | Depression of wet, at do. | Dew Point from the 3.30 P.M. observations. | Humidity do. | In Verandah of the House of the Supt. of the Govt. Gardens. Max. (Self registering.) | Min. (Self registering.) | Portion of sky clear. O. being all cloud 10 pure Sun shine. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 26·91 | ·1 | | | 75 | 14 | 54· | ·51 | 80 | 62 | 6 |
| 2 | ·90 | ·12 | | | 74 | 14 | 53· | ·50 | 80 | 61 | 10 |
| 3 | ·90 | ·12 | | | 73 | 13 | 54·5 | ·52 | 80 | 60 | 10 |
| 4 | ·91 | ·1 | | | 72 | 10 | 57· | ·61 | 81 | 60 | 10 |
| 5 | ·93 | ·1 | | | 72 | 11 | 55·5 | ·58 | 81 | 62 | 10 |
| 6 | ·93 | ·1 | | | 72 | 11 | 55.5 | ·58 | 80 | 60 | 9 |
| 7 | ·96 | ·08 | | | 73 | 13 | 54 5 | ·52 | 79 | 59 | 10 |
| 8 | ·97 | ·06 | | | 73 | 13 | 54·5 | ·52 | 80. | 59 | 10 |
| 9 | ·98 | ·08 | | | 73 | 13 | 54·5 | ·52 | 79 | 59 | 10 |
| 10 | 27.00 | 08 | | | 73 | 13 | 54 5 | ·52 | 81 | 61 | 9 |
| 11 | ·00 | ·12 | | | 73 | 11 | 56·5 | ·58 | 82 | 64 | 10 |
| 12 | .00 | ·12 | | | 75 | 10 | 60· | ·61 | 81 | 65 | 8 |
| 13 | ·00 | ·12 | | | 75 | 90 | 60· | ·61 | 84 | 68 | 8 |
| 14 | 26·96 | ·12 | | | 75 | 12 | 57· | ·55 | 79 | 64 | 8 |
| 15 | ·93 | ·1 | | | 75 | 10 | 60· | ·61 | 78 | 65 | 10 |
| 16 | ·90 | ·08 | | | 73 | 13 | 54 5 | ·52 | 78 | 57 | 10 |
| 17 | ·90 | 08 | | | 73 | 16 | 49. | ·45 | 79 | 58 | 8 |
| 18 | ·91 | 1 | | | 74 | 14 | 53· | ·50 | 80 | 62 | 10 |
| 19 | ·89 | ·1 | | | 75 | 16 | 51· | ·45 | 83 | 63 | 10 |
| 20 | ·91 | ·1 | | | 75 | 15 | 52·5 | ·48 | 82 | 66 | 10 |
| 21 | ·96 | ·12 | | | 74 | 14 | 53· | ·50 | 83 | 68 | 10 |
| 22 | ·95 | ·1 | | | 75 | 13 | 55 5 | ·53 | 81 | 66 | 8 |
| 23 | ·98 | ·08 | | | 73 | 6 | 64· | ·74 | 81 | 67 | 3 |
| 24 | 27·00 | ·08 | | | 74 | 8 | 62· | ·67 | 84 | 67 | 9 |
| 25 | ·01 | ·1 | | | 75 | 10 | 60· | ·61 | 83 | 66 | 10 |
| 26 | .01 | ·1 | | | 74 | 8 | 62· | ·67 | 82 | 62 | 10 |
| 27 | ·00 | ·12 | | | 73 | 8 | 61· | ·68 | 80 | 65 | 8 |
| 28 | 26·99 | ·11 | | | 73 | 9 | 59 5 | ·64 | 79 | 62 | 8 |
| 29 | ·97 | ·1 | | | 73 | 8 | 61· | ·68 | 80 | 67 | 9 |
| 30 | ·96 | ·12 | | | 73 | 9 | 59·5 | ·64 | 82 | 62 | 6 |
| MONTHLY MEANS. | | | | | | | | | | | |
| | 26·9 | 0·1 | 9·1 | 73·7 | 11·5 | 56·6 | 57· | 80·7 | 62·9 | 8·1 | |

BER.

| Wind. Whewell's. Horizontal movement in 24 Hours, in Miles. | Wind. Whewell's. General Direction. | Rain. Crossley's. Inches and tenths. | Moon. Phases of. | |
|---|---|---|---|---|
| 12 | N. | | | Wind variable and shifting. |
| 8 | ,, | | | |
| 16 | N. N. | | | |
| 16 | E. N E. | | | |
| 24 | S. E. | | | |
| 12 | E. | | ☾ | |
| 4 | N. | | | |
| 8 | N. E. | | | |
| 4 | ,, | | | |
| 4 | N.N.E. | | | |
| 2 | ,, | | | |
| 2 | ,, | | | |
| 4 | ,, | | ● | |
| 4 | ,, | | | Dry cool, High Wind. |
| 4 | ,, | | | do. |
| 12 | ,, | | | do. |
| 20 | ,, | | | Dry cold High Wind. |
| 8 | ,, | | | |
| 8 | ,, | | | Fog 6. A. M. |
| 12 | S. E. | | ☽ | Slight do and overcast. |
| 12 | ,, | | | Overcast; Smart shower 5. P. M. at Jungumcottah. |
| 4 | ,, | 0·030 | | |
| 4 | ,, | | | Very foggy morning. |
| 84 | ,, | | | Fog in morning. |
| 56 | E.,S.E. | | | Overcast. |
| 40 | ,, | | | |
| 60 | ,, | | | |
| 60 | ,, | | ○ | Memo. The latter rains having failed the out turn of the Dry crops will not be more than probably ½ an average yield. |
| 40 | ,, | | | |
| 80 | E. S.E. | | | |

| | | Total. | |
|---|---|---|---|
| | | 0·030 | in 1 Day. |

| | Laul Baugh | High Ground |
|---|---|---|
| Mean Monthly Temperature | 71·8 | |
| Maximum | 84· | |
| Minimum | 57· | |
| Mean diurnal Range | 17·8 | |
| Monthly Range | 27· | |
| Mean of observations of dry Bulb inside House at 9.30 A. M. and 3.30 P. M. | ..... | 71·9 |
| ,, Depression of wet at do. do. | ...... | 10·3 |
| ,, Dew Point. at do. do. | ...... | 57· |
| ,, Evaporation Force of at do. do. | ...... | ·30 |
| ,, Humidity at do. do. | ...... | ·61 |

DECEM

| Month and Date. | Standard Barometer. Mean of observations at 9.30 A. M. and 3.30 P. M. | Standard Thermometers. Inside House on the "High Ground." Diurnal Range. | Dry Bulb at 9.30 A. M. | Depression of wet, at do. | Dry Bulb at 3.30 P. M. | Depression of wet, at do. | Dew Point from the 3·30 P. M. observations. | Humidity do. | In Verandah of the House of the Supt of the Govt. Gardens. Max. (Self registering.) | Min. (Self registering.) | Portion of sky clear. O. being all cloud 10 pure Sun shine. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 26·94 | ·12 | | | 73 | 7 | 62·5 | ·71 | 83 | 63 | 9 |
| 2 | ·91 | ·1 | | | 72 | 8 | 60· | ·67 | 79 | 61 | 10 |
| 3 | ·91 | ·1 | | | 72 | 8 | 60· | ·67 | 81 | 60 | 10 |
| 4 | ·93 | ·1 | | | 72 | 7 | 61·5 | ·71 | 79 | 60 | 10 |
| 5 | ·89 | ·1 | | | 71 | 5 | 63·5 | ·78 | 80 | 58 | 9 |
| 6 | ·88 | ·12 | | | 72 | 6 | 63· | ·74 | 77 | 60 | 5 |
| 7 | ·85 | ·1 | | | 70 | 3 | 65·5 | ·86 | 74 | 65 | 0 |
| 8 | ·88 | ·08 | | | 68 | 2 | 64·8 | ·90 | 69 | 64 | 0 |
| 9 | ·93 | ·06 | | | 70 | 3 | 65·5 | ·86 | 75 | 62 | 0 |
| 10 | .97 | ·1 | | | 70 | 5 | 62·5 | ·78 | 79 | 64 | 7 |
| 11 | .96 | ·08 | | | 69 | 4 | 62 6 | ·81 | 78 | 62 | 9 |
| 12 | ·95 | ·1 | | | 71 | 6 | 62· | ·74 | 80 | 63 | 9 |
| 13 | ·94 | ·08 | | | 72 | 7 | 61·5 | ·71 | 80 | 65 | 9 |
| 14 | ·94 | ·08 | | | 72 | 8 | 60· | ·67 | 81 | 66 | 10 |
| 15 | ·96 | ·08 | | | 72 | 7 | 61·5 | ·71 | 81 | 61 | 9 |
| 16 | ·97 | ·1 | | | 71 | 6 | 62· | ·74 | 79 | 60 | 9 |
| 17 | ·96 | ·08 | | | 71 | 7 | 60·5 | ·71 | 79 | 62 | 10 |
| 18 | ·94 | ·08 | | | 70 | 10 | 55· | ·61 | 80 | 64 | 9 |
| 19 | ·95 | ·1 | | | 70 | 10 | 55· | ·61 | 80 | 62 | 9 |
| 20 | ·97 | ·1 | | | 71 | 11 | 54·5 | ·58 | 81 | 63 | 10 |
| 21 | 27·01 | .1 | | | 71 | 10 | 56· | ·61 | 81 | 62 | 10 |
| 22 | ·03 | ·1 | | | 71 | 10 | 56· | ·61 | 80 | 61 | 9 |
| 23 | ·02 | ·12 | | | 71 | 11 | 54·5 | ·58 | 80 | 63 | 10 |
| 24 | ·01 | ·1 | | | 71 | 10 | 56· | ·61 | 82 | 65 | 8 |
| 25 | 26·99 | ·1 | | | 71 | 10 | 56· | ·61 | 83 | 62 | 9 |
| 26 | 27·00 | ·08 | | | 73 | 11 | 56·5 | ·58 | 81 | 59 | 10 |
| 27 | ·01 | ·1 | | | 74 | 11 | 57·5 | ·58 | 80 | 61 | 10 |
| 28 | ·01 | ·1 | | | 75 | 13 | 55·5 | ·53 | 79 | 62 | 8 |
| 29 | 26·99 | ·1 | | | 74 | 12 | 56· | ·55 | 80 | 63 | 6 |
| 30 | 27 01 | ·1 | | | 73 | 10 | 58· | ·61 | 81 | 62 | 10 |
| 31 | ·01 | ·1 | | | 74 | 12 | 56· | ·55 | 80 | 61 | 10 |
| | **Monthly Means.** | | | | | | | | | | |
| | 27· | 0· | 67·5 | 6·1 | 71·5 | 8·1 | 59·4 | ·68 | 79·4 | 62·1 | 8·2 |

BER.

Dr. Oswald writes that a slight rumbling shock of an earth-quake was felt at Sheemoogah at 9. P. M. this day, and the Heavens at the same time were lighted up as if by the most brilliant lightning, this was not felt at Soorub where his encampment was, but the Peons out side reported the next morning, that the Jungles became suddenly as light as day; the village people about corroborated this. A party of travellers at Terrikerray (24 Miles from Sheemoga) saw the brilliant light at the same time; and felt the shock of the earth-quake.

| *Wind.* Whewell's. Horizontal movement in 24 Hours, in Miles | *Wind.* Whewell's. General Direction. | *Rain.* Crossley's. Inches and tenths. | Moon. Phases of. | |
|---|---|---|---|---|
| 40 | S. E. | | | Cool dry wind. |
| 48 | " | | | do |
| 28 | " | | | Clouded over in afternoon. |
| 32 | E. S E. | | | Dull and threatening. |
| 28 | " | | | Little rain in afternoon. |
| 28 | " | | | Drizzle all day. } on Nundy Droog. |
| 32 | E. | 0·065 | | do. } on Nundy Droog. |
| 80 | " | 0·145 | | Driving mist. } on Nundy Droog. |
| 104 | E SE. | | ● | Clear and dry. |
| 100 | S. E. | | | do. |
| 40 | " | | | do. |
| 12 | " | | | Very high wind. |
| 80 | " | | | do. |
| 32 | E. | | | do. |
| 20 | " | | | do. |
| 28 | " | | | High wind. |
| 44 | " | | | do. |
| 28 | E by S. | | | do. |
| 64 | E. | | | do. |
| 60 | E. S E. | | | do. |
| 48 | " | | | Thick fog in morning, moderate wind. |
| 60 | " | | | In many places in England the Thermometer was 8 degrees below Zero (4 feet from ground) & on the grass it was 13.8 below & 32.5 below the average of 43 years. |
| 28 | S.E. | | | Very thick fog in do. |
| 60 | " | | | do. |
| 92 | " | | | |
| 40 | " | | | Fog in morning. |
| 28 | " | | ○ | do. |
| 60 | " | | | Light fleecy clouds half obscuring the sun shine. |
| 72 | " | | | High dry wind. } Mean of Therm: for the last 6 months 73·8 Rain during do. (in 68 days) 24·55. |
| 88 | " | | | do. |
| 112 | " | | | |
| | | *Total.* 0·210 in 2 Days. | | |

| | Laul Baugh | High Ground |
|---|---|---|
| Mean Monthly Temperature......... | 70·7 | |
| Maximum......... | 83· | |
| Minimum......... | 58· | |
| Mean diurnal Range......... | 17 3 | |
| Monthly Range......... | 25· | |
| Mean of observation of Dry Bulb inside House, at 9.30 A. M. & 3.30 P. M. .. | ...... | 69 5 |
| " Depression of wet at do do | ...... | 7·1 |
| " Dew Point. at do do | ...... | 57·9 |
| " Evaporation Force of at do | ...... | ·23 |
| " Humidity at do do | ...... | ·68 |

## ABSTRACT OF TEMPERATURE AND COMPARATIVE STATEMENT.

| STATION. | | *Monthly means.* January. | February. | March. | April. | May. | June. | July. | August. | September. | October. | November. | December. | *Annual.* Maximum. | Minimum. | Mean diurnal Range. | Mean Monthly Range. | Annual Range. | Mean dew Point. | Mean Humidity complete saturation being 1. | Mean force of Evaporation. | Mean Annual temperature. | *Rain.* Depth in inches, &c. | Days of Rain fall. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Laul Baugh Verandah mean of Maximum and Minimum obervations. | 1860. | 70·4 | 76·3 | 82·1 | 84·8 | 83·1 | 77· | 74·8 | 75·5 | 74·4 | 75·4 | 71·8 | 70·7 | 97 | 55·5 | 16·1 | 25·4 | 41·5 | ,, | ,, | ,, | 76·4 | 33·4 | 102 |
| Do. Do. Do. | 1859. | 69·1 | 73·2 | 78·8 | 78·4 | 81·7 | 76·6 | 77· | 74·7 | 75·7 | 75·4 | 72·5 | 71·1 | 97 | 55·5 | 15·5 | 24·1 | 41·5 | ,, | ,, | ,, | 75·3 | 25·5 | 119 |
| Mean of 2 observations at 9.30 A. M. and 3.30 P. M. Inside House on "the High Ground." .. .. .. . .. | 1860. | 69·2 | 74·8 | 79·3 | 80·6 | 80· | 75·2 | 73·8 | 73·9 | 73·3 | 73·9 | 71·9 | 69·6 | 86 | 67 | ,, | 8·9 | 19· | 63·2 | ·69 | ·26 | 74·6 | ,, | ,, |
| Do. Do. Do. | 1859 | 70·9 | 73·6 | 77·4 | 77·7 | 79·6 | 75·6 | 74·2 | 74·1 | 74·4 | 74·2 | 71·4 | 71· | 84 | 65 | ,, | 9·8 | 19· | 64·8 | ·74 | ·23 | 74·5 | ,, | ,, |
| Mean of obs: at 9.30 A. M. at Do. | 1860. | 67·8 | 72·5 | 77·5 | 78·5 | 78· | 73·5 | 72·3 | 72·5 | 71·5 | 72·7 | 70· | 67·5 | 81 | 65 | ,, | 5·2 | 16· | 64· | ·74 | ·21 | 73·1 | ,, | ,, |
| Do. Do. Do. | 1859. | 68·9 | 71·6 | 75·9 | 76·4 | 78· | 74·2 | 73·1 | 72·6 | 72·6 | 72·9 | 70·1 | 69·5 | 82 | 65 | ,, | 6·4 | 17· | 65· | ·76 | ·19 | 73· | ,, | ,, |
| Bangalore Hospital Mean of the observations at Noon for 6 Years........ | | 73· | 76·2 | 83·7 | 86· | 85· | 80·5 | 78·5 | 77·5 | 77·2 | 77·4 | 74·3 | 74·3 | ,, | ,, | ,, | ,, | ,, | ,, | ,, | ,, | 78·8 | ,, | ,, |
| Bangalore computed from Hegne's Tracts.. .. .. .. ... .. .. .. | 1805-6. | 72· | 76·8 | 78· | 81·9 | 83·2 | 74·9 | 74·3 | 73·4 | 74·8 | 72·8 | 71·6 | 67·6 | ,, | ,, | ,, | ,, | ,, | ,, | ,, | ,, | 75·1 | ,, | ,, |
| Madras observatory. .. ... .. ... | 1860. | 77·5 | 77·7 | 81·7 | 85·3 | 90·4 | 89· | 87·1 | 85·6 | 83·7 | 81· | 77·4 | 76·4 | 106 | 62·9 | 14·4 | ,, | 43·1 | 70·7 | ·70 | ,, | 82·5 | 27·6 | 78 |
| Mean of the whole Earth from "Dove's" calculation. .. .. .. .. | | 54·3 | ,, | ,, | ,, | ,, | ,, | 62·4 | ,, | ,, | ,, | ,, | ,, | ,, | ,, | ,, | ,, | ,, | ,, | ,, | ,, | ,, | ,, | ,, |
| Royal observatory at Greenwich mean of 79 Years. .. .. .. .. .. | | 35·7 | 38·2 | 40·9 | 45·7 | 52·6 | 58· | 61·3 | 60·5 | 56·3 | 49·3 | 42·4 | 38·8 | ,, | ,, | ,, | ,, | ,, | ,, | ,, | ,, | 48·3 | ,, | ,, |

*MEMO*—The Instruments in the "Laul Baugh," or Government Gardens, are the same as were used last year, and are suspended 5 feet from the ground, in the Verandah of the Superintendent's House, were the direct rays of the Sun never reach them. They are self registering; of Negretti and Zambra's best make and are noted daily at 9 A. M.

2. The Barometer is one of Casella's best standard ones No. 3900, with brass scales extending from the cistern, to the top of the Mercurial Column; this was not in proper adjustment till the 20th May from which date only are the readings to be depended upon; and it is for this reason that the annual mean has not been inserted.

mean has not been inserted.

3. The Hygrometer is by Casella; the Thermometers used in Mr. Garrett's House on the "High Ground," are self registering, the Maximum being by Negretti and Zambra, and the Minimum by Casella.

4. There is a great difference between the Maxima Minima of the months at the "High Ground," and the "Laul Baugh;" the latter observations are taken, with the Instruments exposed to the heated winds, while those at the High Ground are sheltered from them, by being inside an airy room: another reason of the difference is, that the Government Gardens are some 80 feet lower, and much more sheltered, than the exposed "High Ground."

5. From daily careful and regular observations between Noon and 5 P. M, extending over a period of nearly 3 months [during which time there were some days the hottest on record, and some quite Monsoonish] and from occasional observations at other times, I believe the hottest time of the day to be from about 3 to 4.30 P. M. according to season; and perhaps 3.30 P. M. may be set down as a fair average for the year: the mean temperature of the day appears to be reached about 10.30 A. M. and the lowest about an hour before sunrise.

6. The diurnal oscillations of the Barometer are regulated by the atmospheric wave, which is strikingly regular; the Maximum during the day, being reached about 9.30 A. M. and the Minimum about 3.30 P. M. the means being about 7.45 A. M.; and 0.25 P. M. It is I believe equally regular during the other 12 hours; but I cannot state this from personal observation; the range also is very regular and small the mean being a trifle more than 0.1—

7. The receiver of the Rain Gauge (Crossley's vibrating) was placed 4 feet from the ground, in an open space; and was daily noted. Rain does not often fall between sunrise and noon, and is most frequent about 4 to 7 P. M. This year nearly the average amount fell; but both the former and the latter rains having failed, the crops suffered.

8. The Wind Gauge (Whewell's) was placed on the top of the Chief Engineer's Office, and daily noted from 1st July. The portion of sky clear I only commenced to register on the 1st September; the No. denotes the amount of cloud, or Sun Shine, (on the average,) from 6 A. M. to 6 P. M. The amount of cloud at night I have not been able to note; but have observed that generally, the nights, or the early parts of them, are clear, although the afternoon may have been very much overcast; and this is especially noticeable in the months of April and May; (which is the season for thunder storms) Clouds then bank up heavily, and there is every appearance of heavy rain, but by 8 P. M. the sky is perfectly clear, and starry, and this is the case (which the occasional variation of a sand storm) for many days before rain actually falls.

9. The readings of the Instruments, (as observed,) are registered.

10. Bangalore is in Lat 12·58 N. and Longitude 77·39 E. The base of Commissioner's Flagstaff is 3030 feet above high water mark at Madras, and the mean annual temperature is 75 degrees Fahr: while that of Madras is 85, thus confirming the generally received opinion that a rise of 300 feet cause a fall in the Thermometer of one degree. The soil in the Bangalore Division is (except in the valleys,) generally of a red sandy loam, inclining to gravelly; formed by the disintegration of the Gneissose-Rocks, which are everywhere met with, in every stage of decomposition. The sound Rock may be described as a compact, finely foliated gneiss, with slaty cleavage, which renders it of great importance as an economic, and durable building material; and it has been, in the last 4 years, advantageously employed in the archwork of Bridges. According to the constitution of the Rock, the resulting earth is either kaolinitic, or lateritic,—looking; and of the former, some very refractory fire-clays have been made use of. To the west of the Division the prevailing Rock assumes a more porphyritic character; and to the south, a fossiliferous limestone has been discovered which is said to belong to the upper silurian group.

# GENERAL MEMORANDA ON RAIN FALL.

| NAME OF PLACE. | *Annual mean.* Inches and tenths. | *Annual mean.* Days of rain fall. | *Monthly mean.* January. | February. | March. | April. | May. | June. | July. | August. | September. | October. | November. | December. | Greatest annual fall. | Least Do. | No. of years from which mean is calculated. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bangalore........ | 35 4 | 77 | 0 3 | 0·2 | 0·5 | 1·4 | 5·1 | 3· | 4· | 5 9 | 6·3 | 6· | 1·6 | 1· | 55·1 in 1852. | 15 9 in 1838. | Average of 23 Years. |
| Mysore. .......... | 29·4 | 52 | 0·1 | 0·2 | 0·3 | 2·6 | 5· | 2· | 2·7 | 2·5 | 4·4 | 6·4 | 2·1 | 1· | 52·8 in 1852. | 16·8 in 1840. | ,, 13 ,, |
| Toomcoor..... .... | 31·3 | 44 | 0·13 | 0·4 | 0·3 | 1·6 | 5· | 2·5 | 3· | 4· | 5·6 | 7·8 | 1· | 0·4 | 57·4 in 1852. | 13· in 1838. | ,, 22 ,, |
| Sheemoogah. .. (Neilghery Hills) | 29·3 | 77 | ,, | 0·3 | 0·2 | 1·8 | 4· | 3·4 | 6·4 | 3·6 | 2·4 | 5·5 | 1·1 | 0·4 | 42·8 in 1852. | 15·3 in 1855. | ,, 15 ,, |
| Ootacamund. .. (Neilghery Hills) | 47·7 | ,, | 0·2 | 0·4 | 1· | 4·2 | 5·8 | 6·5 | 4·1 | 5·1 | 6·6 | 8·3 | 4·1 | 1·4 | | | ,, 7 ,, |
| Koteegherry... (Neilghery Hills) | 50· | ,, | 2· | 3· | 6· | 10· | 2· | 2· | 4· | 2· | 2· | 10· | 2· | 5· | | | ,, 1 ,, |
| Dodabetta...... (Neilghery Hills) | 81·7 | ,, | 1·5 | 1·2 | 2·2 | 5·7 | 7·9 | 6·2 | 10·3 | 12·5 | 8·5 | 13· | 8· | 4·7 | 101·1 in 1847. | 61· in 1858. | ,, 12 ,, |
| Mercera.......... | 99·7 | 132 | ,, | ,, | 0 3 | 2·1 | 6·4 | 15·3 | 34· | 23·4 | 7·5 | 9·1 | 1·5 | 0·1 | 119·4 in 1856. | 79·6 in 1855. | ,, 5 ,, |
| London.......... | 22·2 | ,, | 1·5 | ·8 | 1·4 | 1·8 | 1·8 | 1 8 | 2·6 | 1·4 | 2·2 | 2·1 | 2·5 | 2·4 | | | ,, ,, |
| All England...... | 31·2 | ,, | ,, | Spring· | 4·8 | ,, | Summer. | 6 6 | Autumn. | 7·4 | ,, | Winter. | 5·9 | ,, | 67·5 | 19·5 | Several Years. |

## EVAPORATION.

| | |
|---|---|
| Experiments at Bangalore in November and December 1859, weather generally bright and clear. | Mean of 12 days. |
| In a Tin Vessel 1 foot deep, and area of 1½ feet placed on the ground. | 0·221 Inches. |
| Do. Do. 4 Inches deep and ½ foot area, buried to the ground level. | 0·167 Inches. |

## LIGHTNING.

| | |
|---|---|
| 1856 May 13. | 3 Persons struck by Lightning in Bangalore Pettah, 2 died. |
| | Some years ago 7 buildings in Bangalore, Cantonment, were struck at the same time. |
| 1859 March 30. | In Goomnaickenpollium Talook,—1 many knocked down, and ear scorched. |
| ,, May 18. | In Anaicul a man sitting under a tree was killed—Tree struck. |
| ,, ,, 22. | Hoolioor Droog,—house struck; woman and grain inside, scorched. |
| ,, ,, 22. | Baithmungalam,—1 man killed, no mark perceptible. |
| ,, ,, 15. | Burra Balapoor,—1 man killed, on the High road. |
| 1860 ,, 1. | Superintendent's Moonshee killed at Sheemoogah; large tree struck. Boy in tree killed. |
| ,, ,, 11. | Davanhully Talook,—2 Bullocks killed inside house. |
| ,, ,, 13. | 3 Cocoanut trees struck in Bangalore Pettah. |
| ,, ,, 1. | Do. in Maloor Talook. |
| 1858 and 1859. | Chittledroog Division,—10 individuals, and 5 head of cattle, were killed by lightni[illegible] |

The season of 1859 was an unusual one. No heavy rain fell, and only 25½ inches were registered, and this amount [which is much below the average] was distributed over 119 days, (average of 23 years 35·41 inches in 77 days) but though there was such a scanty supply in the Eastern parts of Mysore; the Western districts were well supplied, and the fall both on the Eastern and Western Coasts is said to have exceeded the average.

The year 1859 was thought hotter than usual, but the temperature of the year under Review was still higher.

Bagalore, May 20, 1860

J. PU[illegible]LE,
[illegible] C[illegible]nission.

# SCIENTIFIC INTELLIGENCE.

REVENUE DEPARTMENT.

## PROCEEDINGS OF THE MADRAS GOVERNMENT.

Read the following Proceedings of the Board of Revenue, dated 28th November 1861, No. 6,593.

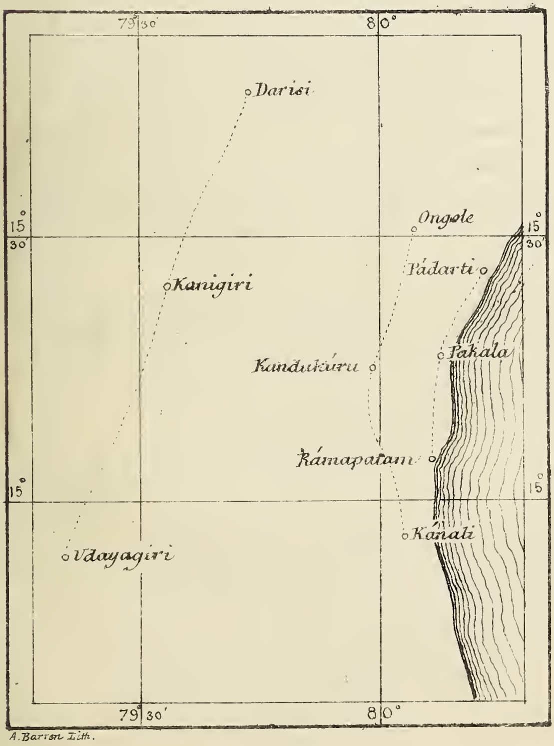
Read the following letter from J. W. B. DYKES, Esq., Collector of Nellore, to W. HUDLESTON, Esq., Secretary to the Board of Revenue, Chepauk, dated 9th November 1861, No. 233 :

SIR,

1. The rain report for October, which I have the honor to forward herewith, calls for special remark, as the fall on the 20th at Pakala is registered at 15·35 inches.

2. When two years ago, the fall of rain at Nellore was registered at 14 inches, considerable doubt was expressed as to the accuracy of the measurement, though the gauges kept by both the Revenue and Public Works Departments gave pretty nearly the same results; and this being the case, it is probable, that still less credence will be given to a fall of upwards of 15 inches in the 24 hours.

3. I give in the margin a sketch of the positions on the map of the stations where gauges are kept in the Northern Division of this District. And dividing these station into three lines, running North and South, the Board will observe that the corresponding stations on each line show a fall of rain in certain fixed proportions. For instance, the northern-most stations on



each line are Padarti, Ongole, Darisi; Padarti being on the coast Ongole 10 miles inland, and Darisi about 45; and at these three stations, the registered fall is, Padarti 14·91, Ongole 7; Darisi 3·75; or twice as much on the coast as ten miles inland, and four times, as 45 miles inland. Again, taking a line from east to west, about half a degree South, we have the stations of Pakala, Kandukuru, and Kanigiri, with much the same relative positions and distances as the above, and it might be said precisely the same proportions, viz., Pakala 15 35, Kandukuru 8·55 and Kanigiri 2·65. And if we take the Southern-most line of this Northern Division, which is pretty much on the 15° of latitude, we have, with a greatly decreased force, still the same proportions, viz., Ramapatam 7·2, Kanali 3·4, and Udayagiri 1·6, the relative positions and distances being again much the same as in the preceding groups, though in this instance the extreme inland station is South of the other two, whilst in the two former groups, it is in both cases a little to the North.

4. Of course the preceding figures may be all a mere coincidence; and it is quite possible the measures may be all alike erroneous, either of which suppositions would equally negative any inference to be drawn from the above singularly marked proportions; but I am not aware that the measures are erroneous. They were all prepared under the supervision of my predecessor Mr. Elton, who took much interest in every thing that could tend to throw a light on meteorology; whilst those who keep the accounts have been carefully instructed, and have very simple accounts to keep. And under these circumstances, I cannot but look on the rain report now submitted as a correct and reliable document, and as such throwing considerable light on the laws that regulated the very heavy fall of rain in the North of this District on the 20th ultimo.

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Ordered to be submitted for the information of Government, and that copy be communicated to the Chief Engineer, the Conservator of Forests, the Government Astronomer, and the Inspector General Medical Department.

( A true Copy and Extract.)

(Signed) W. HUDLESTON,

*Secretary.*

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ORDER THEREON, 4th January 1862, No. 5.

Communicated to the Government Astronomer.

(True Extract.)

(Signed) C. G. MASTER,

*Deputy Secretary to Government.*

*Notes on Dr. Moore's book concerning the Lost Tribes, and the Saxons of the East and of the West.* By Rev. W. Taylor.

This book—with a startling title*—is perhaps divisible into two books; the one theological, with a theoretic inquiry after the missing ten tribes of the Beni-Israel; the other archæological, and presenting some singular views and statements, as to rock-inscriptions in the *lat'h* character, which Dr. Moore regards as exclusively *Bâuddha* in kind. These two portions do not appear like homogeneous parts of one whole. It is my impression that Dr. Moore began to write with Chap. 11 page 227, or thereabouts; and that the Chapters preceding were afterwards written, the better to make up a book A full review of the former portion would properly belong to a professedly religious publication: seeing that the author takes a high religious standing, and dilates on prophecy, whether fulfilled or unfulfilled, on his own proper and peculiar interpretation; wherein probably few will follow him. In this, the earlier part, there are some highly poetical and beautiful passages, yet indicating the predominance of a lively, and somewhat heated imagination—not the very best qualification, possibly, for decyphering inscriptions on rocks, or on stone pillars. As regards those inscriptions the whole effort appears to me to be a failure; for I question if Dr. Moore will carry any well informed reader along with him, throughout his entire course; and that there are hasty assumptions, on very slender grounds, must strike the attention of any one, who reads with a moderate portion of thought and carefulness.

In the ethnological and etymological portions of the book, the author appears to me to imitate the worst features in Bryant's Analysis of Ancient Mythology, and Wilford's various disquisitions in the Bengal Asiatic Researches. He even quotes the latter on the *Sacœ*, in the white island—meaning the Saxons in England—as if Wilford had never acknowledged the forgeries of his pundit. In Hindu mythology, and historical romance Dr. Moore is very deficient: for instance there are statements about *Ráma* that would have scarcely been pardonable at the close of the last century.

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* The lost tribes and the Saxons of the East and of the West with new views of Buddhism, and translation of rock-records in India, by George Moore, M. D. &c. London 1861.

Dr. Moore very properly distinguishes—as do the Hebrew writings—between the Beni-Israel of the ten tribes, and the *Yihûdìm*, or Jews of Judah and Benjamin. The book also contains some judicious observations on the foretold restoration to Palestine, as applicable not to the whole, but only to a part of the Beni-Israel; and concerning the tribe of Ephraim as the representatives of those who shall not return, but will probably, some day, renounce their idols. On the other hand, so far as I can see, his notion of finding Israelites among the Saxons in England, turns on an etymological quibble of Sharon Turner, in his History of the Anglo-Saxons: who could find no better derivation of the word Saxons than *Sakai* or *Sacae-suni.* This latter word in Sanscrit means *a Son*: but Mr. Turner, taking advantage of the Latin plural (*Saxoni*) turns *Sacae-suni* into Saxons in the plural number. Dr. Moore adopts this quibbling derivation. On that etymology, and on the mere supposition that when the *Sacae*, or Scythians, invaded the countries in which the ten tribes were located, these last joined the Scythians, as making head against common enemies, and that thenceforward both became one common people —rests the grand hypothesis of the book, that the Saxons were Beni Israel. Equally rapid, and unsolid, is an assumption that the Beni Israel, and the *Bâuddhas* are the same people. There is no proof, but merely probability urged; and, on the said derivation, and the alleged probability depends, let it be repeated, the important conclusion that the Saxons in England were descendants of the ancient Sacae, mixed up with Israelites of the ten tribes; and another conclusion also, that because *Buddha* bore the name of *Sakya* (or *Sacya-sinha*) and that a *Sacai*-era is now common in some parts of India—therefore the *Bauddhas*, or converted followers of Buddha, were of the mingled race of the Scythians, and the Beni-Israel. The whole is intended to joint in with a main discovery in the volume, that the *Bauddha*, or *lat'h* inscriptions are in the Hebrew language; though not in the square Chaldee character into which Dr. Moore professes to transliterate the said inscriptions—an operation that may call for a little further attentive examination.

On the book first coming into my hands I at once turned to page 232 for the alphabet. I found this to be, in the main, Mr. J. Prinsep's which in some important letters I know to be wrong; and the dif-

ferences in Dr. Moore's alphabet do not correct what is erroneous. The vowel affixes are not found, in stone inscriptions, as Dr. Moore represents them to be. The system of transliteration into the square Chaldee letter is open to objection, and the double letters of the Sanscrit, and other Indian alphabets, cannot be represented by two following Chaldee letters, except when the very short vowel *sheva* is quiescent. For instance *Shm* (which in Sanscrit would read *shma*) cannot be adequately represented by *shin* and *mem* as following letters, without vowel points. According to the points used the two letters would mean *a name* (sub.) or *thither*, (adv.) and, since so great a difference in those two letters depends on the vowel points, the reader will be prepared to appreciate a further remark as to the prevailing omission of vowel points in the sequel.

The first inscription given is preceded by the Bauddhist symbol termed *Dhamma*: it is a symbol as much so as the *svastica*, or any other conventional sign. Yet Dr. Moore finds in it the word *Godama*; and then represents this name in Chaldee letters as *Yihodamma* meaning as he states "god-like." But the transliteration of the hard syllable *go* into *Yiho* is, at the outset, of no great promise.

The inscription No. 1 contains seventeen consonants, each one carrying a vowel affix or prefix, and there are three dots (*anusvaram*) with the power of the nasal *m* or *n*. Dr. Moore transliterates these twenty syllabic or other signs, by thirty consonants, all of which require a vowel in order to their enunciation; but he only gives the vowel *o* over three letters. These three vowel-points are three *dots* on the head of the letters, it is true, but with different import, I conceive, from the three *anusvaras* of the *lat'h* letters. I am not perfectly certain of every *lat'h* letter in No. 1, but the reading I think is something like this.

Ram kauka saiyottasa tangam jado chalutto rāmam.

Dr. Moore's transliteration is: Yoh d m m l k k sh l n o y sh th gob m o l d r y d m m pho n h.

That the three first words may read "Godama (or† Johdama) king of Kash" may be; but there is nothing like that in the Bâuddhist

† Yohdama melech kash.

symbol and letters following in the inscription itself, even if read as far as *possible* by the aid of his own alphabet; seeing that the vowel marks which he gives in the alphabet, and those found in No. 1 are quite different.—Throughout the book there is a withholding of the vowel-points, which are necessary, in order to precision in any work, not otherwise well known; and throughout there is an apparent recklessness as to any corresponding number of consonants: both objections are fatal as to the correctness of the assumed transliteration.

Going back to a plate facing 215 is an inscription, which I take to be mortuary, containing thirteen consonants each one bearing a vowel. This piece Dr. Moore transliterates by twenty-four consonants, with only *two* vowels. The last word in the inscription is, without doubt, *layam*, loss or death: a word which Mr. J. Prinsep read *dānam* a gift. Dr. Moore translates his own transliteration thus—"And his passing away was as a lamentation, and my beauty and my grace are as lamentation, O Judges!" If any one were disposed to forgive a nearly doubling the number of consonants, and an elision of eleven vowels, he must still feel that letters would not be cut on stone to carry down to posterity, a sentence so very inane.

In the rendering of the Girnar inscription, the phrase—"the mouth of ruin hath pleaded their cause"—occurs twenty-two times. If precisely the same letters recur so many times on the face of the rock itself, surely it must have been intended to convey some meaning of greater importance. When Job said, "Oh that my words were graven with an iron pen, and lead in the rock for ever"—he gave a sentence of great weight for the subject. Rock inscriptions can scarcely repeat, over and over again, mere inanities.

Dr. Moore has given the lengthy "inscription on Feroz's pillar in English letters." It cannot be here quoted; but referring any one, in the least degree competent, to the book itself, I ask—do you call *that* Hebrew? For example, look at line 8.—*Vidi samti gampta pitri su, su, su aja gulu su su su su aja viyam.* Again I ask, is *that* Hebrew?

Either Dr. Moore was imposed on by some one in his employ—as more than one gentleman, in this country has been imposed on by his Pundit or Moonshee—or else he has imposed on his readers a

tissue of nonsense, from some motive, or end, best known to himself. However the dilemma may be cleared, it is a pity that so much labor and expense in printing a book have been next to thrown away —unless indeed the object were to make money, by deceiving the unwary, with a taking subject and flash title : a supposition that I would not hastily, and uncharitably make. There are I repeat many redeeming passages, and much that is either curious or useful ; but that the Bauddhists in the east, or the Saxons in the west, were descendants from the *Beni Israel,* I think remains unproved ; and, to the best of my judgment and belief, the *lat'h* or Bauddhist inscriptions are not as yet correctly translated ; whether by the late Mr. J. Prinsep, or Prof. Wilson, or by the present Dr. Moore.

I may perhaps venture to state my opinion, that the inscriptions in the *lat'h* character certainly are in an ancient Indian language. I ground this opinion mainly on my being able to make out words, and parts of sentences ; though I have not been able, with perfect satisfaction, to read the entire of an inscription. Dr. Moore has copied a plate, with an inscription, from Col. Cunningham's book on the Bhilsa and Sanchya Topes. Col. C. states that it represents a woman of Thibet dancing before a Chief. The latter is seated with an expression of complacency on his countenance ; two or three female members of his household are in the opposite corner. The lusty and rather awkward figure of the performer, grotesque in its expression, is in the foreground, and two men in the left corner, seated on the ground, are beating small kettle drums. The inscription over head is plain, and apparently complete. I am not quite sure of two letters ; but I believe the reading to be—

> *Vilósa ka holangi kári dhora pákam makagi.*
> Pastime of the performer female, the chief beholding rejoices, i. e. The chief looking on the dancing woman is pleased.

This sense corresponds so exactly with the scripture, that I am induced to think it correct. If so, the language has a resemblance to the general substratum of southern languages ; and the first word is a *prácrit* of the Sanscrit *vilásam* sport or pastime. This one inscription, if any view of it be solid, would at once remove any idea of Hebrew being the language of any of the said inscriptions. Dr. M. transliterates it in his usual fashion.

The Hebrew is by no means a language commonly known in England. How a medical man came to have time and inclination to acquire it, has caused me a doubt. Dr. M. must have made some degree of acquaintance with it; but looking at the version of the engraving on Feroz's pillar I cannot help thinking that he reckoned on the ignorance of the greater portion of his readers; and was disposed to risk consequences as to the small remainder.

The Greek is more within the line of a physician. Medical men in their technicalities, affect the Greek even to barbarism. In this language also Dr. Moore has failed, for the Greek legends on Bactrian coins are not dealt with fairly; but *twisted* in a singular manner: the more surprising, as more certain of detection, and exposure than Hebrew transliterations. I do not enlarge on this point, because I have seen some remarks by the Editor of the Madras Journal &c. on one of the legends; and I trust that gentleman (in a note or addendum) will state his own views on the subject. His estimate of the book, I believe, is very similar to my own.

Were the Literary Journal a Review it would not be unsuitable to take out a few poetical or descriptive passages, wherein Dr. Moore appears to the greatest advantage; but the ethnological and archœological are properly the only portions suitable to a secular and scientific Journal. Considering that the Bauddhists and Brahmans were originally one people, Dr. Moore perhaps has not wholly missed his mark; since it is my opinion—for which I have elsewhere* given some reasons, and have more in reserve—that the Brahmans are descendants of the Beni-Israel, or ten tribes of the great captivity under Shalmaneser king of Assyria. I agree with Dr. Moore in his estimate of a book an the lost ten tribes by Dr. Asahel Grant, an American: Dr. Grant was however probably right as to the location of the first small captivity under Tiglath Pileser of Assyria.—It is an interesting subject; and if public attention can be turned in that direction, it is one which may issue in unlooked for discoveries.

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* Vide—Introduction to Vol. 2 of a Catalogue Raisonné of Government M. S. S. Articles, Saiva, Vaishnava and Theological.

## NOTE BY THE EDITOR.

An Editor, especially of a Literary and Scientific Journal, is generally credited, either in his own person or as the reputed leader of a formidable band of *literati*, with the possession or command of vast and varied stores of erudition. He must always speak *ex cathedrâ* ; his censure or praise must be dealt round without any misgiving or hesitation ; and he must never admit an error, or confess to the smallest incapacity. But in Madras where the impersonality of an Editor is by no means complete, and where the limited extent of his resources is tolerably well known, it would be absurd to assume the air of a final judge and authority, or to screen pretensious sciolism behind the regal "we."

Being neither a Sanscrit nor a Hebrew scholar, and my knowledge of Greek being more a matter of distant recollection than of present proficiency, I should therefore under ordinary circumstances have been very reluctant to pass summary judgment on a book such as that now under review, which has evidently been the result of great labour and thought, however perverted, and the subject of which is far removed from the ordinary sphere of my studies and avocations. But in the present instance the author's offences are so flagrant, his pretensions to occult learning and original research so provokingly obtrusive, that I cannot decline the tempting invitation of the Rev. Mr. Taylor that I should add a few words to his interesting paper, assist in the exposure of Dr. Moore's distorted paragrams, and show how plain a tale can put him down.

In pursuance of his determined purpose of finding the Lost Tribes of Israel among the Bauddhists of North India, and of identifying them with the Saxons of the West, Dr. Moore introduces two gold coins of the Greek Bactrian King, Kanerkes, supposed to have reigned about A. D. 100. These coins are represented in fig. 2 and 3 of the plate at p. 293 of the book. Both of them present on the obverse the image of the King ; on the reverse of No. 2 is the well-known figure of the Goddess Diana, with the crescent moon on her head, and the word NANAIA ; on the reverse of No. 3 is the equally well-known figure of Apollo, his head encircled by the solar

halo or glory, and superscribed with the word ʽΗΛΙΟΣ (Helios), which every school boy knows is Greek for the Sun, and is one of the ordinary titles and characters under which Phœbus Apollo makes his appearance in Grecian mythology.

It will hardly be believed that Dr. Moore offers the following explanation of the legends on these coins :—"The coins of this king of kings, perhaps *Leo Kanerkes*, bear two remarkable words, in the one case being *Nanajah ;* and in the other *Elias*. These words stand at the back of figures of *Godama ;* that the figures are those of Godama we learn from the monogram containing his name, as shown in a former chapter. The words referred to are in Greek letters, but as Greek they have no meaning ; as Hebrew, however, they are full of significance when applied to Godama : for *Nanajah* signifies the *offspring of God ;* and *Elias* is the Greek rendering for the Hebrew word *Elijah*, as we find in the New Testament, and in the version of the Seventy, well-known to the inquiring Greeks, and probably to those numerous Greek colonists over whom *Godama*, at least through Kanerkes and Kadphises, reigned."

The most remarkable point perhaps in this tissue of absurdities is the audacious statement that the word *Helios,*—tortured by Dr. Moore, by changing *o* into *a*, and omitting the aspirate, into *Elias*, —has "no meaning in Greek," when it is in fact the ordinary word for the sun. Then it is worthy of notice that he converts the Greek *Nanaia* into *Nanajah,*—a form which is not reconcileable with any modern or reasonable system for rendering Oriental words into English letters, but which, from its harmony with the barbarous etymology adopted in James the 2nd's reign by the compilers of the authorised Version of the Bible, is calculated to give his "transliterations" an air of Scriptural Hebraism, and thus to make a favourable impression on the unlearned public.

As these coins by no means make their first public appearance in Dr. Moore's book, he seems to think it necessary to make some allusion to the previous and accepted descriptions given of them by competent scholars, but he does so with flagrant unfairness and concealment of the truth. Thus he says at p. 295 :—"In remarking

on coins having Nanajah or Nanaia on them, Professor Wilson, in his "*Antiqua Ariana*," traces the use of the term in a religious sense to Armenia, but he does not give us its meaning."

I have turned to the Antiqua Ariana, and will now prove by extracts from its pages what Professor Wilson really does say. At p. 14 speaking generally of the coins of the Kanerkes type he observes :—"The legends on these coins, written in a barbarised form of Greek, were completely decyphered by Mr. Prinsep; on the reverse occurred Greek or Hellenised native names of the Sun and Moon, as Helios, Mithro, Mao, &c., and frequently the term Nanaia." I need scarcely point out that Prinsep and Wilson did not fail to recognise the familiar effigies of the Sun and Moon, and that they did not consider the word Helios to "have no meaning in Greek."

At p. 359 of the Antiqua Ariana Professor Wilson says :— "Upon the reverse of some of the coins we find the legend Helios, HΛIOS. It must be granted that the terms Helios and Mithro indicate the relinquishment of all conformity to the Indian system of belief which prevailed under Kadphises, as shown by the types on his coins. The device accompanying this legend is that of a male figure, with the fillet of royalty on the head, which is also surrounded by a nimbus with rays. It is, no doubt, intended for a personification of the Sun."

And at p. 362 : —"Another term, and one of which the Persic origin can scarcely be disputed, Nanaia, occurs upon very many coins, both large and small. The title accompanies a female figure, in which we must have either, the goddess Anaitis or Anahid of the Persians, or her priestess,—the Artemis, (Diana) whose worship Artaxerxes Memnon, according to Berosus, endeavoured to spread throughout Persia, and especially in Bactria, and whom Mr. Avdall has successfully identified as Anaia or Nanœa the tutelary goddess of Armenia. We find her also mentioned as Nanœa in the Apocrypha, as the goddess of Elymais, in whose temple Antiochus was slain. (Maccabees, B. II, chap. I v. 13.)"

Dr. Moore does not hesitate to write that Wilson "traces the use of the term in a religious sense to *Armenia*, but *does not give us its*

*meaning.*" Yet it will be seen that Wilson points out that Nanaia is a personification of the Moon, the Artemis or Diana of the Greeks; and that the goddess is referred to under that name in a book so accessible as the Apocryphal second book of Maccabees, as one of the deities worshipped by Antiochus, one of the progenitors or predecessors of the Greek Bactrian Kings. Professor Wilson adds:—"It is very likely that her worship extended along the south coast of the Caspian, and thus reached some of the Indo-Scythic tribes, by whom it was imported rather late into India. Of the migration of Nanaia thither there is every probability that the memory survives in the Bibi Nani, or Lady Nani, who is reverenced by the Mahomedans, and worshipped as a form of Parvati by the Hindus in various parts of Afghanistan"

The figure of *Nanaia* on the Bactrian coins is clearly and undoubtedly that of a female, yet Dr. Moore shuts his eyes to this fact, and pronounces it, as well as the very distinct and quite different male figure of *Helios*, to be the representation of Godama, the Buddhist incarnation.

But I think we have had enough of this foolish book. The Rev. Mr. Taylor thinks that Dr. Moore is right in some of his conjectures, and that he has "not wholly missed his mark." This is quite possible; out of a hundred random reckless shots one may have been successful. I remember enough of the Greek I learned at School to be able to quote the first example in the Syntax of the Eton Grammar:—

*πολλάκι τόι κάι μῶρος ἀνηρ κατακάιριον ἔιπε*,—a foolish man has frequently said an appropriate word,— or as we may translate it on the present occasion. "Perhaps even *Moore* may have hit upon a truth." I will not follow the bad example of our author, and profess my firm belief that the name *Moore* is derived from the Greek *μῶρος*—in the vocative case *μῶρε*—but I do most positively declare that such a derivation would be quite as reasonable and quite as probable as most of those contained in the Lost Tribes, or the Saxons of the East and West.

E. B.

# PUBLIC DEPARTMENT.

## PROCEEDINGS OF THE MADRAS GOVERNMENT.

*Dated* 16*th April* 1862, *No.* 464.

The Government have for some years maintained a Museum at Madras in which many valuable specimens have been deposited, but the collection illustrative of the Natural History of even this Presidency is still very defective. This has probably arisen, in the first place, from ignorance on the part of the public that any value is attached to specimens of Natural History, or that such contributions will deserve or receive a place in the Museum ; and in the second place from want of instruction as to the objects to be collected and the mode of preserving them.

2. The accompanying short paper (adapted to India from one which was issued by the Government of New South Wales) contains clear and practical instructions as to the Mode of preserving specimens, and the Governor in Council resolves to publish and circulate it here, with the double intention of placing such information within the reach of the public and of, thereby, affording them the assurance that every thing which bears upon any of the many branches of Natural History from the minutest insect or shell, to the skin and skeleton of the largest mammal, is of value, and will be thankfully received and acknowledged by the Superintendent of the Museum, Captain Mitchell.

3. The advantages to be derived from the existence at the Head Quarters of the Presidency of a Museum containing not merely the productions of the Southern part of India but also those of other portions of the globe are manifest. In order however to obtain specimens from other countries the Superintendent of the Museum must be in position to give those of India in exchange and this he cannot do unless from the different Districts he is furnished with specimens illustrative of their Natural History.

4. The Governor in Council entertains the hope that the public will very generally co-operate with the Government in this desirable object and that they will the more readily do so when they learn

from the "Hints" now published how easily very valuable assistance may be rendered by them.

(True Extract.)

T. PYCROFT,

*Chief Secretary.*

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*Hints on the Preservation of Specimens of Natural History, intended for country residents (adapted to India.)* By John Macgillivray, f. r. g. s., *Author of "Voyage of H. M. S. Rattlesnake," &c.*

It is not necessary in the present age to address any arguments in favour of Natural History, as one of the sciences, for it has long been established as such, although certainly yielding in point of importance to many others. But I would say a few words with regard to the amusement, rational enjoyment, and intellectual improvement, which a taste for Natural History pursuits, so easily acquired, brings within the reach of those especially who are residents in the country. It need not at all interfere with the more serious duties of life; it agreeably fills up one's leisure hours. Every stroll in the garden, or in the jungle or forest, or by the sea-shore, presents the observer with objects of interest, whether of vegetable or animal life. Whenever a person takes an interest in contemplating, examining, and studying these things, and follows his bent of mind as far as his time and opportunities allow, he becomes a Naturalist—a student of nature—for such an appellation is by no means to be appropriated solely by those further advanced in the study, who have mastered technicalities and are acquainted with the various scientific arrangements, and possess some knowledge of the external and internal structure of the objects in question. And then what a wide field of research does the Natural History of India afford! Yet those who have done the most to make the world at large acquainted with its natural productions have seldom been permanent residents, but travellers explorers, and naturalists from other countries. Yet every resident in the country, provided he be a person of observation and of ordinary education, could furnish a fund of information regarding the objects around him which would be highly valued by all true naturalists, who are not content with the mere inspection of cases of

stuffed birds, or drawers of insects of the history of which little is known. The periods of arrival and departure of migrating birds, and notes respecting their habits, the seasons at which certain insects make their appearance, their food, their metamorphoses, and a thousand other similar matters, are well worthy of being recorded; and if any one should note down, day by day, whatever he has observed bearing on these points, the increasing interest of the subject will induce him to continue his pleasing task. And should observations of this kind be made and recorded in various localities, a comparison of the results would doubtless evolve many important deductions bearing upon the Natural History of this great territory.

Many residents in the interior are deterred from attempting to preserve specimens of natural history, by entertaining an erroneous idea of the difficulties attending the various operations to ensure that end. But, with the exception of that part of Taxidermy (or the preparation of skins) which embraces the setting up in position of quadrupeds and birds, an operation requiring a considerable amount of practice, and affording scope for much taste in order to be successful in imitating the natural form and characteristic attitude of the creature to be stuffed, I can assure the young beginner that with an ordinary amount of ingenuity, neat handedness, and patience, he will meet with no great difficulties to be overcome. On the contrary, at every step he will find himself becoming more and more proficient, and take so much the greater interest in the pursuit. But, without entering further into this subject, I shall proceed to give a few practical remarks on the mode of preserving the various objects of natural history.

## MAMMALIA.

(Including all animals which suckle their young).

The mouth and nostrils, having been stopped up with cotton-wool or tow, any shot holes having been plugged up, an incision is to be made with a sheep-knife in the central line along the breast and abdomen, of sufficient length to admit of the extraction of the body. The skin is then to be detached in the same manner as in, skinning a sheep, the legs are to be disjointed from the trunk, and

the bones cleaned of flesh down to the toes ; the tail may either be stripped from within, or the bones and flesh removed through and incision from without. The skin of the head should be detached as far as the lips. The body may then be removed by cutting through the neck. The skin should now be turned inside out and carefully cleaned of fat and flesh, the skull should be similarly cleaned, and the brain extracted, after enlarging the hole at the back of the head. The skin is now to be meared (by means of a brush) with arsenical soap rubbed up with water into a lather, and burnt alum in powder should then be dusted over it and rubbed in along with the soap. The bones of the legs should have tow, cotton, or wool wrapped round them to restore them to their previous dimensions ; the cheeks and sockets of the eyes may be similarly treated, and the moist skin should be restored to its former condition, or with the hair outside. The skin should be filled out to nearly its natural dimensions with any suitable dry substance, and the opening in the lower surface stitched up. Incisions should be made in the palms of the hands and soles of the feet, if fleshy, and as much of the interior (excepting the bones) removed as can be got at. These incisions as well as the lips and margins of the orbits, should be brushed over with a feather or brush dipped in a solution of corrosive sublimate.* The object of distending the skin is to ensure its thorough drying, that of using the alum is partially to tan the skin, and prevent the hair from falling off. When dry the stitching may be removed, and the stuffing extracted, thus reducing the bulk of the specimen. It is perhaps almost needless to mention that a skin prepared in this manner can afterwards be relaxed and softened to prepare it for being "set up" with the aid of wires in any attitude selected.

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* Take of white arsenic 1 lb. ; of hard white soap 1 lb. ; of carbonate of potass $\frac{1}{4}$ of a pound. Melt the soap in thin slices with a sufficiency of water, in which the carbonate of potass has been dissolved, over a gentle fire; when thoroughly mixed add the arsenic and stir well until the whole has been incorporated ; pour it into earthenware vessels, and when cold it is ready for use with water and a brush. Spirits of the wine is the best solvent, but water will do, though not so well, as corrosive sublimate is very sparingly soluble in water, while the addition of camphor to the spirits of wine enables it to take up an additional quantity of the sublimate.

## BIRDS.

Of the many species of Indian birds, there is a very large proportion which, from their beauty, singularity of plumage or habits, or their rarity, we should wish to see represented by preserved specimens. The process of preserving the skins of birds is very simple—a scalpel or two, a pair of nail scissors, some cotton, wool, or tow, a pot of arsenical soap, a brush, needles and thread, are the only articles required to be provided, and even some of them may be dispensed with. When a bird is shot the mouth is to be stuffed with cotton wool, any blood removed by wiping or washing if necessary, and the shot holes, if bleeding or large, plugged with a piece of cotton twisted into a point and introduced with a pin. The bird should then be wrapped up in paper. When the body is cold the upper wing bones should be broken close to the body, when they do not interfere with future operations. Lay the bird on its back on a table, separate the feathers on each side of the central line, and make an incision from the top of the breast bone to near the vent. If plaster of Paris, or powdered chalk, or flour—but the last is the worst—be at hand, use it in dusting between the body and the skin as you proceed to separate the latter carefully, introducing pledgets of cotton, to prevent the feathers getting soiled. When the skin has been detached for a little way all round, using the finger for this purpose as much as possible in preference to the knife, cut through the leg at the thigh joint, then work down to the rump, and cut through at the base of the tail with one snip of the scissors, taking care to retain the tail bones in which the feathers are fixed. The skin of the rump should then be turned back and retained with the left hand, when the process of detaching the skin may be continued as far as the shoulders. The wings are then to be separated, where the bone had previously been broken, the neck stripped as far as the head, the skin drawn over the head as far as the ears (which are to be cut through at the base), the eyelids cleared from their attachments, the ears scooped out with the scissors, and the skin drawn down to the base of the bill.* The neck should then be cut through at its

* In the case of some birds with large heads and slender necks, as all the ducks, the black cockatoos, &c., where the skin of the neck cannot be drawn over the head, it is necessary to cut off the neck as

junction with the skull, and the tongue removed with it. Cut off from the back part of the skull a sufficiency to admit of scooping out the brain, and clean the skull of all superfluous flesh. Take the wings and strip the skin down to the end of the second joint, cut off the remainder of the shoulder bone, and clean the next two bones bare. Treat the legs similarly, only retaining all the bones left. Then clean the bones of the rump, taking care to remove the oil glands, and all fat and grease elsewhere on the skin, which by this time has been turned inside out. Then take your arsenical soap and anoint the rump bones and about the tail, lay a few small flakes of cotton on the wet skin, to prevent the feathers becoming soiled, anoint the legs and skin about them, wrapping a little cotton round the bones, returning the skin of them and of the rump to their natural positions. Tie with thread the wing bones together, keeping them a short distance apart, and returning each wing to its place after applying the soap. The skull should then be soaped over, as well as the neck, and a small pledget of cotton placed in each eye-socket; the skin may then be returned over the head and neck, which operation will materially be facilitated, by pulling upon a piece of thread previously passed through the nostrils, before commencing to skin the bird. The feathers may now be smoothed down, and the wings placed in their natural position, where they will be kept by a hard pledget of tow pressed down tightly upon the string connecting them—another pledget should be placed on each side of the breast, which further secures the wings. Then roll up some tow into the former size of the neck, and introduce it by means of a stick into the hole in the back of the skull, where it may be tightly fixed. The neck may now be shortened as much as is required, the remainder of the skin distended with stuffing materials, but not too fully, and the opening sewn up, beginning from above—a few stitches only are required. The bill should be tied, the legs crossed and tied, and after the feathers have been again smoothed down, the stuffed skin should be inserted into a cone of paper head first and there left until it is sufficiently dry, which will be the case in a few days.

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high up as possible and extract the remainder. and clean the head through an opening in the back of the neck, which can be afterwards sewn up.

## REPTILES.

The generality of reptiles, as snakes, lizards, frogs, &c., are best preserved in spirits. Large lizards, however, may be skinned and stuffed; sawdust or dry sand being the best material, for filling with, as it can be forced into all the recesses, by means of a stick and prevent shrivelling of the skin—when dry the stuffing can be shaken out if thought desirable. The various kinds of fresh water turtles of this country are easily preserved. The breast-plate should be more or less completely removed, by making an incision along the lines of junction with the sides and neck, and when the room is obtained for getting at the inside, all the interior can be removed, as well as the neck and soft parts of the head. After anointing with arsenical soap and filling up with any suitable materials, the breast-plate is to be replaced and fixed with pins, and the legs arranged in their natural position on a board until dry.

## FISHES.

Small fishes, like small reptiles, are best preserved in spirits. However, the skins of fishes may easily be prepared in one or other of two ways. The first, and simpler, is to retain one half of the skin only, including the central fins, and removing all the soft parts. The skin having been cleaned by washing and allowed partially to dry, the arsenical soap should be applied to the inside, and wool, or cotton, or tow employed to distend the one-sided skin to its natural dimensions. It is then to be turned over on a board, when, with the aid of pins and bands of paper, the fins can be displayed in a natural position, and the correct outline of the fish retained. By the other process both sides of the skin are preserved. An incision is made with the scissors along the centre of one side, reaching from the top of the gill to the base of the tail fin. This will give plenty of room for extracting the whole of the interior, detaching the skin, snipping through the base of the fins from within, removing the brain, eyes, and soft parts of the head wherever they can be reached. After washing, and anointing with arsenical soap, filling up the hollows with cotton wool, the opening should be sewn up. The loose bag then presented by the skin should be filled

with sand, poured in at the mouth, and with a stick the requisite degree of convexity can easily be given to one side. The other side, or that where the incision was made, should be laid flat on a board, and secured in its place with pins and strips of paper, and the fins displayed as taste may dictate. When thoroughly dry the sand may be shaken out. Fishes preserved in either of these ways make a fine show if displayed in glass cases on a white board. A coat of copal varnish applied *as soon as the skin is dry*, retains much of the colour which otherwise would fade, besides giving a fresh and life-like appearance to the specimen.

## INSECTS, &c.

No branch of the wide subject of Entomology can be followed up by residents in the interior with greater facility and with more satisfaction than Entomology. Putting Botany aside for awhile, there is no kindred pursuit which, even to females, and perhaps to them especially, affords so many inducements to cultivate it as the study of insect life. I need only refer my reader to the nearest ant-hill, or a bee hive in the garden, or rear from the egg, through the successive stages of caterpillar, chrysalis and butterfly, any one of our native species. In these instances, much will be found not only to attract the attention but to induce the exercise of the higher powers of the mind ; but my object here is merely to point out the simplest means of preserving specimens of insects. It would be idle to point out, the advantages of cork-lined, air-tight, and glazed insect cases, with the usual adjuncts of entomological pins ; but I would here deal merely with the ordinary means at the disposal of almost every resident in the interior, showing how a collection of insects may be made. If the collection is intended for tarnsmission to some distant locality where the specimen can be finally prepared and arranged, nothing more is required with respect to most insects (except butterflies and moths) than to put them in a pickle jar two-thirds filled with any spirit of moderate strength, which when filled, corked up, and properly secured from leakage and evaporation, may be transmitted to any part of the world. After this the individual specimens can be pinned, set (a term accorded to the disposal of the legs, wings, &c., antennæ or horns), in the manner considered most suitable

for the displaying of these parts. Butterfles for transmission to a distance may simply be reduced to a small compass by pressure between the forefinger and thumb, bringing the upper surface of the wings of each side in contact with those of the other, and doubling back the antennæ between them. The butterflies may then be enclosed in a piece of paper folded up in a triangular form. Afterwards the recipient, by steaming it, or by placing it for some hours over damp sand, can render the body sufficiently lax to enable him to set it. With moths, however, as many have large soft bodies, it is necessary with a pointed pair of scissors to make an opening along the lower part of the abdomen, extract the intestines, pour in a few drops of the solution of corrosive sublimate, and introduce a little cotton wool to prevent the sides from coming in contact. They may then be treated as butterflies. But if the object be to make a collection of insects to be kept for personal gratification, the first step should be to have prepared a wooden case of any convenient size, about 2½ inches deep, with a close fitting lid. A very good insect case can be made of millboard. If prepared cork cannot be had, bottle corks may be cut into slices about three-eights of an inch in thickness, and glued into the bottom of the box as close together as they can be placed. If there is any choice of pins they should be as long and as slender as can be obtained. Beetles, which may be procured in almost all situations, in ponds, under bark, stones, and logs, on flowers and leaves, in dung and carrion, &c., are best killed by being placed in a tin box with a lid, close to the fire, when they will shortly be stifled, care being taken that they are not burnt. This seemingly cruel process is by far the most humane known to me, in the absence of chloroform or prussic acid. Beetles may also be speedily killed by immersion for a few moments in boiling water, or by dipping a phial containing them in the same. A little experience will soon teach what process is best adapted for each particular kind of beetle ; for example, none that are bright colored, or have a mealy or downy surface, should be dipped into hotwater. When dead a pin should be stuck through the right wing-cover, and after drying for a few days the beetle may be transferred to the insect box. Flies, bees, wasps, &c., may be treated in the same way. Butterflies are readily killed by a pinch on the breast, when they

may be transfixed, stuck on cork, their wings expanded and kept in the required position with pins and slips of paper or card for a few days, when they can be placed in the insect box. Large bodied moths cannot be killed by a pinch; it is therefore unfortunately requisite to pin them alive and kill them by inserting a red hot needle into the abdomen. These large bodied moths require the contents of the abdomen to be removed, otherwise they will speedily decay. Grasshoppers, "mantises" and "animated straws," &c., require the contents of the abdomen to be removed, and replaced with cotton, after a few drops of the solution of corrosive sublimate have been applied to the inside. Centipedes, spiders, and scorpions, should be similarly treated, but they are best preserved in spirits. An insect net is indispensable to the collector. The simplest as well as the best is made of 3 feet 6 or 8 inches of brass wire, the thickness of a quill, with the two ends of the wire turned off at right angles to form a handle three or four inches long, and the remainder bent so as to make a ring a foot in diameter. Tie the ends tightly together. Make a bag of gauze or mosquito netting three feet deep, and attach it to the ring. The net should be fixed to a stick of any length convenient to handle. It is chiefly used in capturing butterflies and other winged insects during flight or upon flowers, but may be used in a variety of other ways. But the finest specimens of butterflies and moths are not those captured with the net, but those which are bred from the caterpillar and chrysalis. In the former case the caterpillar should be enclosed in a box with a gauze covering to admit air, and daily supplied with leaves of the kind on which it was found feeding, until it assumes the chrysalis state. I may conclude this subject by mentioning that many night-flying insects are attracted by a light, and may thus be brought within reach of the collector. Crabs of all kinds, except very small ones (which may be treated as insects), are best prepared by removing the shell from the back with the knife, cleaning out all the soft parts of the interior, extracting (by holes at the joints) with a wire the contents of the great claws, soaking the whole for a couple of hours in fresh water, anointing the inside with arsenical soap, replacing the shell, and laying the specimen on a board to dry, with the legs pinned up as required. Care must be taken however that

the specimen should not be dried *in the sun*, as that would affect the colours. Lobsters, crayfish, prawns, &c., should have the hinder part detached immediately behind the back shell. This gives ready access to the interior, which should be cleared out, when the soap brush should be applied, the inside stuffed with cotton, the two portions united with gum or glue or a pin or two, the ends of which can be snipped off. The legs can then be arranged on a board as with crabs.

## RADIATE ANIMALS.

Star-fish and sea-eggs should first be immersed in fresh water for several hours, to extract the salt. The former, if of small size, may be dipped for a few minutes in boiling water and dried in the shade. Larger ones require to be opened with the knife along the lower surface of the arms, and the soft interior sucked and squeezed out. The solution of corrosive sublimate can be poured in so as to reach the whole of the interior; the specimen may then be dried. Sea-eggs should have the interior cleaned of their contents, by removing the mouth (which can afterwards be replaced) and washing out the inside, following this up by pouring in the solution of corrosive sublimate, and shaking it about so as to diffuse it. With respect to crabs, star-fish, sea-eggs, corallines, sea-weeds, and many other marine productions, I would wish the collector to be impressed with the fact that the principal object is thoroughly to get rid of the salt by a good soaking in fresh water. Unless this be effected the specimen is apt to become damp, mouldy, and will ultimately fall to pieces, as sea salt is highly deliquescent, and in damp weather attracts moisture from the atmosphere.

## SHELLS, &c.

The land shells of India are more numerous in point of species, and exhibit more singularity in form, variety in markings, and beauty of colour, than is generally supposed; and although most of them come under the designation of *snails*, they are objects of great interest to the collector, whether scientific or otherwise. They are to be found under bark, logs, and stones, as well as on the trunks and leaves of trees, under dead leaves, and in tufts of

upon a half sheet of white paper of the requisite size. Arrange the floating plant according to taste, and then gently withdraw the paper by one edge with the plant upon it. The sea-weed adheres to the paper with the branches and leaves displayed as under water, and the moisture is to be got rid of by pressure between sheets of blotting paper frequently changed until the whole is dry, which will be in a day or two.

# PROCEEDINGS.

*At a Meeting of the Managing Committee of the* Madras Literary Society *and Auxiliary of the Royal Asiatic Society held at the Club house on Thursday the* 11*th April* 1861, *at half past* 6 *o'clock P. M.*

Present.

The Hon. E. Maltby, *Chairman.*
Major Genl. McCleverty.
R. P. Harrison, Esq.
Major W. J. Wilson.
R. S. Ellis, Esq. c. b.
J. Talboys Wheeler, Esq.
J. D. Mayne, Esq.
Capt. T. Evans Bell, *Honorary Secretary.*

The Secretary laid before the Meeting the usual Monthly Statement of the Society's Funds prepared up to 11th April 1861.

Here enter Statement.

Resolved that the above Statement is satisfactory and be passed.

Read Letter from the Royal Society of Edinburgh, acknowledging the receipt of Volume V, new series, of the journal.

Ordered to be recorded.

Read Letter from the New Orleans Academy of Sciences, acknowledging the receipt of Volumes from I to V. new series of the Journal. Ordered to be recorded.

Read Letter from H. A. Brett, Esq., to J. D. Sim, Esq., forwarding a Statement showing the places where the Earthquake was felt on the 4th March 1861, in the District of Salem.

Ordered to be transferred to the Sub Committee of Papers for publication in the forthcoming Number of the Journal.

E. Maltby,
*Chairman.*

T. Evans Bell,
*Honorary Secretary.*

*At a Meeting of the Managing Committee of the* MADRAS LITERARY SOCIETY *and Auxiliary of the Royal Asiatic Society held at the Club house on Thursday the 9th May* 1861, *at half past* 6 *o'clock P. M.*

PRESENT.

| | |
|---|---|
| The Hon. E. Maltby, *Chairman.* | J. T. Wheeler, Esq. |
| The Hon. W. A. Morehead. | Capt. T. Evans Bell, *Honorary Secretary.* |
| Major W. J. Wilson. | |

The Secretary laid before the Meeting the usual Monthly Statement of the Society's Funds prepared up to 9th May 1861.

Here enter Statement.

Resolved that the above Statement is satisfactory and be passed.

Read Proceedings of Government and Order thereon dated 26th April 1861, No, 599, with reference to the despatch from England of a Tin Case containing certain Manuscripts of the late Lieutenant Frye in the Khond language.

Ordered to be recorded.

Read Letter from Messrs. Saunders and Ottley, offering to supply Books, &c., to the Society.

Ordered to be recorded.

Read Letter from Messrs. Allen and Co., acknowledging the receipt of £ 150-0-0 and forwarding Invoice of Books, &c.

Ordered to be recorded.

E. MALTBY, *Chairman.*

T. EVANS BELL, *Honorary Secretary.*

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*At a Meeting of the Managing Committee of the* MADRAS LITERARY SOCIETY *and Auxiliary of the Royal Asiatic Society held at the Club house on Thursday the* 11*th July* 1861, *at half past* 6 *o'clock P. M.*

PRESENT.

| | |
|---|---|
| The Hon. E. Maltby, *Chairman.* | R. P. Harrison, Esq. |
| Major W. J. Wilson. | Capt. T. Evans Bell, *Honorary Secretary.* |
| J. T. Wheeler, Esq. | |

The Secretary laid before the Meeting the usual Monthly Statement of the Society's Funds prepared up to 11th July 1

Here enter Statement.

Resolved that the above Statement is satisfactory and be passed.

Read Letter from Mr. J. A. Barth of Leipsic acknowledging receipt of £ 133-13-0 for Ethnographical Casts, and recommending the purchase of a series of Ethnographical Crania and Skeletons, and Photographic Edition of Messrs. de Schlagintweit's Panoramas of India and High Asia.

Ordered to be recorded.

Read the Letter from the Messrs. de Schlagintweit requesting to be supplied with the Society's Journal, and referring to an Extract from their Publications, stated to have been sent, but which has not yet been received.

Resolved that a set of the Journal from the commencement of the New Series, and a copy of every future issue be forwarded to Messrs. de Schlagintweit.

E. Maltby, *Chairman.*

T. Evans Bell, *Honorary Secretary.*

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*At a Meeting of the Managing Committee of the* Madras Literary Society *and Auxiliary of the Royal Asiatic Society held at the Club house on Thursday the* 8*th August* 1861, *at half past* 6 *o'Clock P. M.*

Present.

The Hon. E. Maltby, *Chairman.*
General W. A. McCleverty.
Major W. J. Wilson.
J. T. Wheeler, Esq.

The Secretary laid before the Meeting the usual Monthly Statement of the Society's Funds prepared up to 8th August 1861.

Here enter Statement.

Resolved that the above Statement is satisfactory and be passed.

*At a Meeting of the Managing Committee of the* MADRAS LITERARY SOCIETY *and Auxiliary of the Royal Asiatic Society held at the Club house on Thursday the* 12*th September* 1861, *at half past* 6 *o'clock P. M.*

PRESENT.

J. T. Wheeler, Esq.
R. P. Harrison, Esq.
Captain T. Evans Bell, *Honorary Secretary.*

The Secretary laid before the Meeting the usual Monthly Statement of the Society's Funds prepared up to 12th Instant.

(Here enter Statement)

Resolved that the above Statement is satisfactory, and be passed.

Read letter from Lieutenant Mitchell communicating a Prospectus of a celebrated Picture on the point of publication in England, containing 50 Portraits of Eminent Men of Science living in 1807-8.

The Committee are of opinion that an Engraving such as that described in the Prospectus is not required for the purposes of the Madras Literary Society, but that the Prospectus may lie on the Table for the information of Members.

Read Proceedings of the Madras Government, dated 10th August 1861, No. 1525, reporting an Earthquake in the Village of Nandigamah on the 24th July 1861.

Referred to the Committee of Papers for publication in the Journal.

Read letter from Captain Raverty relative to his Push to Publications supplied to the Society.

Resolved that a Copy of Captain Raverty's forthcoming translation of the Pushto Poem, Goolshan-i-Roh be ordered.

Read letter from Dr. Shaw complaining of the selection of books, and pointing out some which he recommends.

Dr. Shaw's suggestions will be attended to.

Read letter from Mr. Hammond of the Foreign Office, forwarding a packet of Pamphlets transmitted by the Government of Prussia for presentation to the Society.

Ordered to be recorded.

Read Proceedings of the Anniversary Meeting of the Royal Society of Antiquarians of the North, held at Copenhagen on the 27th May 1861.

Ordered to be recorded.

Read Draft of a letter proposed to be sent to Messrs. Allen and Co.

The Draft letter is approved and ordered to be despatched.

T. EVANS BELL,
*Honorary Secretary.*

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*At a Meeting of the Managing Committee of the* MADRAS LITERARY SOCIETY *and Auxiliary of the Royal Asiatic Society held at the Club house on Thursday the* 10*th October* 1861, *at half past* 6 *o'clock P. M.*

PRESENT.

General A. W. McCleverty.
J. D. Mayne, Esq.
Major W. J. Wilson.
Captain C. H. Roberts.
Capt. T. Evans Bell, *Honorary Secretary.*

The Secretary laid before the Meeting the usual Monthly Statement of the Society's Funds prepared up to 10th October 1861.

Here enter Statement.

Resolved that the above Statement is satisfactory and be passed.

Read letter from the Secretary to the Literary Society of Manchester, acknowledging receipt of Numbers 9 and 10 new series of the Journal, and requesting the preceding Numbers.

Resolved that the Numbers of the new series of the Journal previous to No. 9 be forwarded to the Literary Society of Manchester.

Read letter from the Librarian of the Royal Physical and Economic Society of Konigsberg, forwarding two Parts of the "Schriften der Koniglche physikalische oeconomischen Gesellschaft," and requesting an interchange of Publications.

Resolved that the thanks of the Society be offered to the Royal Physical and Economic Society of Konigsberg, that their offer of exchanging publications be accepted, and that a complete set of the new series of the Journal be forwarded at the first opportunity.

T. EVANS BELL,
*Honorary Secretary.*

*At a Meeting of the Managing Committee of the* MADRAS LITERARY SOCIETY *and Auxiliary of the Royal Asiatic Society held at the Club house on Thursday the* 12*th December* 1861 *at half past* 6 *o'clock P. M.*

PRESENT.

| | |
|---|---|
| Major W. J. Wilson. | Capt. T, Evans Bell, *Honorary Secretary.* |

The Secretary laid before the Meeting the usual Monthly Statement of the Society's Funds prepared up to 12th December 1861.

(Here enter Statement.)

Resolved that the above Statement is satisfactory and be passed.

Read letter form the Secretary to the Linnean Society acknowledging the receipt of Nos. 8, 9 and 10 of the Journal.

Ordered to be recorded.

Read letter from C. Oldham, Esq., forwarding Part 1, Vol. 1 of the Palæontologia Indica.

Ordered to be acknowledged with thanks.

Read letter from Messrs. H. and R. de Schlagintweit acknowledging the receipt of Nos. from 1 to 10, new series of the Journal

Ordered to be recorded.

T. EVANS BELL,
*Honorary Secretary.*

*Daily Results of Meteorological Observations, made at the Madras Observatory during the year* 1861.

| Date. | January 1861. Barometer reduced to 32° Faht. | Thermometers. Means. Dry. | Wet | Max. | Min. | Wind. | Rain. | Weather. | February 1861. Barometer reduced to 32° Faht. | Thermometers. Means. Dry. | Wet | Max. | Min. | Wind. | Rain. | Weather. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Inches | ° | ° | ° | ° | | Inches | | Inches | ° | ° | ° | ° | | Inches | |
| 1 | 30·067 | 75·1 | 68·7 | 79·7 | 69·1 | E N E | | Light clouds | 29·955 | 77·0 | 70·4 | 83·4 | 69·2 | E S E | | Nearly fine. |
| 2 | ·054 | 74·9 | 68·6 | 80·7 | 69 1 | E N E | | Cloudy. | ·947 | 76·3 | 68·3 | 82·0 | 67·8 | N E | | Fine. |
| 3 | ·040 | 75·8 | 67·9 | 80·7 | 67·7 | E N E | | Hazy. | ·914 | 75·4 | 69·7 | 81·3 | 66·1 | N E | | Do. |
| 4 | ·021 | 74·5 | 67·4 | 79·5 | 66·5 | E N E | | Do. | ·898 | 74·7 | 69·1 | 83·5 | 65·9 | W S W | | Do. |
| 5 | 29·985 | 74·3 | 68·3 | 79·9 | 66·4 | E N E | | Do. | ·865 | 74·2 | 68·8 | 83·9 | 65·4 | S | | Do. |
| 6 | ·974 | 75·1 | 69·6 | 80·4 | 67·0 | E N E | | Light haze. | ·869 | 74 8 | 69·5 | 84·8 | 65 6 | S | | Do. |
| 7 | ·964 | 74·7 | 69·6 | 79·9 | 67·1 | E N E | | Fine. | ·919 | 75·5 | 70·0 | 86·7 | 66·2 | S | | Do. |
| 8 | ·944 | 74 9 | 70·2 | 81·4 | 68·0 | N E | | Do. | ·952 | 75·8 | 71·2 | 85·8 | 67·3 | S S E | | Light haze. |
| 9 | ·974 | 75·5 | 71·2 | 82·6 | 68·9 | E | | Do. | ·952 | 74 8 | 70·4 | 84·0 | 67·5 | E N E | | Cloudy till night |
| 10 | ·984 | 75·0 | 70·7 | 81·6 | 68 0 | E N E | | Do. | ·939 | 76·5 | 70·8 | 84 0 | 66·3 | Variable | | Fine. |
| 11 | .982 | 76·4 | 71 9 | 82·3 | 70·6 | E | | Light clouds. | ·919 | 74·6 | 68·4 | 84·4 | 65·9 | S S W | | Light haze. |
| 12 | ·989 | 77·3 | 72·3 | 81·4 | 73·0 | E | | Do. | ·960 | 74·0 | 67·6 | 82·9 | 65·0 | S | | Fine. |
| 13 | ·987 | 76·8 | 71·5 | 81·8 | 70·8 | E N E | | Nearly fine. | ·967 | 73·8 | 67·9 | 81·9 | 65·1 | S | | Do. |
| 14 | ·985 | 78·0 | 72 3 | 82·8 | 75·1 | E N E | | Light haze. | ·962 | 75·4 | 68·0 | 82·7 | 68·3 | E | | Do. |
| 15 | 30·013 | 78·0 | 72 1 | 82·5 | 75·2 | E N E | | Frequent clouds | ·936 | 73·2 | 67·4 | 81·8 | 64·3 | E N E | | Do. |
| 16 | ·005 | 77·1 | 71·8 | 83·4 | 71·6 | E N E | | Light clouds. | ·931 | 72·9 | 67·6 | 82·7 | 63·1 | E N E | | Do. |
| 17 | 29·952 | 75·9 | 71 0 | 82·7 | 69·2 | E N E | | Fine. | ·952 | 76·0 | 72·0 | 84·8 | 63·2 | S S E | | Do. |
| 18 | ·958 | 75·4 | 71·1 | 81·7 | 68 4 | E | | Do. | 30·000 | 76·0 | 72·3 | 83·3 | 67·0 | S E | | Do. |
| 19 | ·982 | 74 9 | 70·6 | 82·1 | 68·2 | E S E | | Do. | ·041 | 77·4 | 73·8 | 82·6 | 68·9 | E | | Light haze. |
| 20 | ·991 | 76·1 | 71·5 | 82·2 | 67·6 | E S E | | Do. | ·011 | 78·6 | 74·7 | 83·9 | 70·1 | E | | Fine. |
| 21 | ·958 | 78·0 | 73·5 | 84·3 | 71·0 | E S E | | Do. | ·005 | 79·8 | 75·9 | 85·0 | 74·2 | E N E | | Flying clouds. |
| 22 | ·904 | 78·8 | 74·5 | 84·4 | 72·2 | S S E | | Do. | ·006 | 79·4 | 75·5 | 84·5 | 73·4 | E | | Light clouds. |
| 23 | ·918 | 78 8 | 74·1 | 84·7 | 73 0 | S | | Do. | 29·995 | 77·9 | 73·5 | 83·5 | 70·7 | E N E | | Do. |
| 24 | ·949 | 77·9 | 73·1 | 83·5 | 71·4 | S S E | | Do. | ·971 | 77·5 | 73·6 | 83·2 | 68·8 | N E | | Do. |
| 25 | ·969 | 78·1 | 72·6 | 83 6 | 71·7 | E | | Do. | ·949 | 75·7 | 70·4 | 83·9 | 67·5 | E | | Do. |
| 26 | ·957 | 78·1 | 72·8 | 83·1 | 72·3 | N E | | Do. | ·945 | 75·9 | 71·3 | 85·6 | 67·0 | E N E | | Do. |
| 27 | ·938 | 78·7 | 72·9 | 84·6 | 75 8 | E N E | | Flying clouds. | ·955 | 78·1 | 72·5 | 86·3 | 69·4 | E N E | | Cloudy. |
| 28 | ·922 | 76·5 | 71·5 | 83·3 | 70·0 | E N E | | Light clouds. | ·962 | 78·9 | 74·6 | 86·6 | 70·9 | E N E | | Fine. |
| 29 | ·886 | 76·8 | 70·9 | 85·0 | 68·4 | N N E | | Light haze, | | | | | | | | |
| 30 | ·895 | 76·8 | 70·4 | 83·7 | 68·1 | S E | | Fine. | | | | | | | | |
| 31 | ·936 | 76·9 | 70·3 | 83·7 | 68·8 | E S E | | Hazy. | | | | | | | | |
| Mean. | 29·970 | 76·5 | 71·1 | 82·4 | 70·0 | E | None. | | 29·953 | 76·1 | 70·9 | 83·9 | 67·5 | E S E | None. | |

## Daily Results of Meteorological Observations, made at the Madras Observatory during the year 1861.

### March 1861.

| Date. | Barometer reduced to 32° Faht. | Thermometers. Means. Dry. | Wet | Max. | Min. | Wind. | Rain. | Weather |
|---|---|---|---|---|---|---|---|---|
| | Inches | ° | ° | ° | ° | | Inches. | |
| 1 | 29·697 | 80·3 | 76·1 | 87·5 | 72·5 | S S E | | Fine. |
| 2 | ·984 | 80·3 | 75·1 | 87·4 | 72·2 | S | | Do. |
| 3 | ·915 | 78·7 | 72·9 | 86·4 | 69·5 | S | | Do. |
| 4 | ·897 | 77·3 | 71·3 | 84·8 | 67·7 | S | | Do. |
| 5 | ·902 | 78·4 | 72·8 | 85·6 | 69 0 | S | | Do. |
| 6 | ·891 | 80·1 | 74·6 | 87·2 | 71·7 | S | | Hazy. |
| 7 | ·889 | 79·9 | 73·8 | 87·5 | 71·7 | S | | Nearly fine. |
| 8 | ·904 | 80·0 | 74·0 | 86·7 | 72·0 | S S E | | Fine. |
| 9 | ·915 | 80·2 | 74·4 | 87·9 | 71·0 | S | | Do. |
| 10 | ·896 | 82·0 | 76·7 | 89·1 | 74·7 | S S E | | Do. |
| 11 | ·916 | 82·2 | 76 9 | 89 6 | 75·4 | S S E | | Light haze. |
| 12 | ·958 | 81·9 | 77·0 | 85·8 | 78·8 | E | | Cloudy. |
| 13 | ·964 | 77·9 | 73·3 | 83 8 | 74·3 | N E | ·155 | Overcast. |
| 14 | ·912 | 79·1 | 74·2 | 86 5 | 71·3 | E N E | | Light clouds. |
| 15 | ·869 | 79·3 | 74·3 | 87·8 | 71·4 | S E | | Do. |
| 16 | ·867 | 80·3 | 75·3 | 87·9 | 73·4 | S S E | | Nearly fine. |
| 17 | ·897 | 82·2 | 77·3 | 89·7 | 74·3 | S E | | Light clouds. |
| 18 | ·820 | 84·0 | 78·0 | 89·7 | 75 9 | S E | | Cloudy. |
| 19 | ·861 | 82·6 | 77·5 | 90·4 | 76·7 | S | ·016 | Overcast. |
| 20 | ·854 | 80·8 | 77·7 | 86·6 | 75·1 | S | ·730 | Do. |
| 21 | ·873 | 81·0 | 77·0 | 87·9 | 73·1 | S | ·130 | Cloudy. |
| 22 | ·842 | 82·7 | 77·5 | 94·2 | 73·6 | S W | | Light clouds. |
| 23 | ·832 | 84·1 | 79 1 | 92·5 | 75·5 | S W | | Do. Overcast night |
| 24 | ·843 | 85.2 | 80·2 | 91·9 | 75·5 | S S W | | Light clouds. |
| 25 | ·868 | 85·1 | 78·2 | 91·7 | 77 0 | S S W | | Hazy. |
| 26 | ·904 | 84·2 | 77·5 | 89.8 | 74·6 | S | | Do. |
| 27 | ·898 | 83·7 | 77 4 | 89·5 | 74·2 | S E | | Fine. |
| 28 | ·898 | 82·5 | 77·1 | 89·4 | 73·4 | S | | Clear. |
| 29 | ·923 | 81·5 | 75·1 | 88·2 | 71·8 | S | | Do. |
| 30 | ·927 | 80·5 | 75·2 | 87.8 | 71·0 | S | | Hazy clouds. |
| 31 | ·878 | 82·2 | 75·9 | 89·0 | 70 8 | S | | Fine. |
| Means | 29·896 | 81·3 | 75·9 | 88 4 | 73·2 | S S E | 1·031 | |

### April 1861.

| Date. | Barometer reduced to 32° Faht. | Thermometers. Means. Dry. | Wet | Max. | Min. | Wind. | Rain. | Weather. |
|---|---|---|---|---|---|---|---|---|
| | Inches | ° | ° | ° | ° | | In°. | |
| 1 | 29·868 | 81·6 | 76·7 | 89.0 | 70·6 | S | | Fine. |
| 2 | ·876 | 81·6 | 75·3 | 88 8 | 71·3 | S | | Do. |
| 3 | ·863 | 82 5 | 76·6 | 89·1 | 69 6 | S S E | | Do. |
| 4 | ·810 | 85·0 | 78·9 | 90 7 | 73·9 | S | | Light clouds |
| 5 | ·792 | 84·8 | 78·5 | 91·2 | 75·5 | S S E | | Hazy. |
| 6 | ·777 | 85·8 | 78·7 | 92 3 | 74·6 | S | | Do. |
| 7 | ·775 | 85·3 | 78 4 | 91 6 | 74·2 | S S E | | Cloudy. |
| 8 | ·783 | 85·4 | 78·7 | 91·4 | 74·5 | S E | | Do. |
| 9 | ·784 | 84·1 | 79·1 | 92·3 | 76.6 | E S E | | Hazy clouds. |
| 10 | ·791 | 86 0 | 79 5 | 92·3 | 75·5 | S E | | Cloudy. |
| 11 | ·781 | 85 8 | 79·8 | 91·4 | 77·0 | S S E | | Changeable. |
| 12 | ·752 | 85·7 | 78·5 | 92·2 | 75·6 | S S W | | Flyingclouds |
| 13 | ·759 | 86·6 | 79·8 | 91·1 | 77·0 | S S W | | Hazy. |
| 14 | ·721 | 86 6 | 80 0 | 92·3 | 77·0 | S S W | | Light clouds |
| 15 | ·768 | 86·7 | 80 3 | 92·5 | 77·9 | S S W | | Fine. |
| 16 | ·799 | 86·3 | 80·1 | 93 5 | 77·4 | S S W | | Nearly fine |
| 17 | ·788 | 86 4 | 80 0 | 92·3 | 77·4 | S S W | | Fine. |
| 18 | ·799 | 86·2 | 79·4 | 92·7 | 75·6 | S | | Do. |
| 19 | ·827 | 86·7 | 79·0 | 92·1 | 75 9 | S | | Do. |
| 20 | ·836 | 86·2 | 78·9 | 92 3 | 75·9 | S | | Do. |
| 21 | ·799 | 86·7 | 79 6 | 93 2 | 75·4 | S | | Do. |
| 22 | ·754 | 88·3 | 81·5 | 95·2 | 78 5 | S W | | Hazy. |
| 23 | ·720 | 88·5 | 81·0 | 95·9 | 78·9 | S W | | Fine. |
| 24 | ·745 | 86·2 | 80 9 | 93·0 | 78·5 | S S W | | Do. |
| 25 | ·823 | 86·5 | 79·9 | 93·5 | 78·6 | S | | Hazy. |
| 26 | ·834 | 86 9 | 79·5 | 93·3 | 76·5 | S S E | | Fine. |
| 27 | ·805 | 87·8 | 79·4 | 94·1 | 76 2 | S S E | | Do. |
| 28 | ·719 | 89·4 | 81·0 | 99·7 | 77·6 | S S W | | Do. |
| 29 | ·693 | 90·1 | 79·5 | 100 9 | 77·8 | W | | Do. |
| 30 | ·725 | 90·0 | 79·8 | 100·8 | 79 3 | S W | | Do. |
| Means | 29·786 | 86·2 | 79·3 | 93·1 | 76·0 | S | | |

*Daily Results of Meteorological Observations, made at the Madras Observatory during the year* 1861.

| Date. | May 1861. Barometer reduced to 32° Faht. | Thermometers. Means. Dry. | Wet | Max. | Min | Wind. | Rain. | Weather. | June 1861. Barometer reduced to 32° Faht. | Thermometers. Means. Dry. | Wet | Max. | Min | Wind. | Rain. | Weather. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Inches | o | o | o | o | | Inches | | Inches | o | o | o | o | | Inches | |
| 1 | 29·783 | 88·5 | 81·0 | 95·2 | 79·4 | S W | | Nearly fine. | 29·628 | 87·8 | 77·8 | 97·9 | 82·4 | W S W | | Overcast. |
| 2 | ·791 | 85·3 | 80·7 | 93·4 | 78 7 | S S W | | Light clouds. | ·682 | 87·5 | 78·5 | 94·4 | 82·0 | W | | Do. |
| 3 | ·749 | 88 3 | 81·0 | 96·0 | 78·2 | S S W | | Fine. | ·696 | 91·1 | 78·9 | 100·7 | 81·8 | W S W | | Nearly overcast |
| 4 | ·694 | 89·7 | 80·8 | 100·1 | 79·4 | S S W | | Hazy. | ·729 | 90·4 | 77·9 | 98·7 | 81·9 | W N W | 0·118 | Cloudy. |
| 5 | ·663 | 89·3 | 80·9 | 96·1 | 79·4 | S W | | Do. | ·738 | 89 8 | 77·1 | 99·3 | 83·9 | W | | Overcast. |
| 6 | ·718 | 90·9 | 81·1 | 101·8 | 79·2 | S S W | | Do. | ·714 | 89·9 | 78·5 | 99·0 | 83·4 | W N W | ·018 | Cloudy. |
| 7 | ·695 | 90·2 | 81·2 | 99·7 | 79·4 | S S W | | Do. | ·713 | 89·1 | 77·8 | 99 2 | 84·2 | S W | | Hazy. |
| 8 | ·679 | 92·1 | 80·3 | 101·8 | 79·8 | S W | | Fine. | ·729 | 89·7 | 78 4 | 98·3 | 83·4 | W | | Often overcast. |
| 9 | ·681 | 91·3 | 79·4 | 102·1 | 79·8 | Variable | | Do. | ·726 | 89.3 | 77·7 | 102·5 | 82·6 | W N W | | Light clouds. |
| 10 | ·708 | 90·6 | 80·6 | 102·0 | 82·4 | S W | | Light haze. | ·739 | 88·1 | 77·1 | 100·6 | 82 6 | W S W | | Heavy clouds. |
| 11 | ·748 | 90.8 | 80·5 | 103·7 | 82 0 | S W | | Fine. | ·730 | 88·3 | 78·7 | 99·2 | 81 4 | W S W | | Dull. |
| 12 | ·657 | 91·0 | 79·2 | 107·5 | 82·9 | S W | | Do. | ·744 | 88·8 | 80·0 | 101·4 | 81·6 | W N W | | Changeable. |
| 13 | ·645 | 89·3 | 77·6 | 98·3 | 82·4 | Variable | | Cloudy. | ·732 | 89·3 | 78 2 | 101·5 | 81·5 | W | | Hazy. |
| 14 | ·662 | 85·6 | 80·1 | 97·8 | .... | S | | Do. | ·717 | 89·1 | 77·8 | 100·5 | 81·6 | Variable | | Nearly fine. |
| 15 | ·675 | 89 5 | 78·8 | 97·1 | .... | S | | Dull. | ·663 | 88·8 | 77·0 | 99·6 | 81·7 | W N W | | Cloudy. |
| 16 | ·710 | 88·9 | 81·2 | 95·7 | 82·4 | S S W | | Do. | ·667 | 88·2 | 76·8 | 102·0 | 79.9 | N W | | Light clouds. |
| 17 | ·717 | 86·3 | 80·1 | 94·2 | 82·2 | S | | Cloudy. | ·690 | 88·6 | 78 7 | 99·9 | 82·9 | N | | Cloudy. |
| 18 | ·686 | 87·7 | 80 5 | 93·8 | 81·6 | S S W | | Fine. | ·725 | 88·4 | 78·1 | 100·1 | 82·3 | W | | Do. |
| 19 | ·671 | 82 9 | 78·2 | 95·5 | 80·2 | S S W | 1·204 | Cloudy, | ·747 | 89·5 | 77·9 | 98·0 | 83·4 | S W | | Light clouds. |
| 20 | ·626 | 87·7 | 78·1 | 98 9 | 78·7 | W N W | | Do. | ·741 | 87·2 | 79 0 | 95·1 | 81·9 | Variable | | Nearly overcast. |
| 21 | ·608 | 88·4 | 78·3 | 99·0 | 82 2 | W N W | | Light clouds. | ·691 | 89·7 | 80·2 | 100·2 | 81·4 | N W | | Light clouds. |
| 22 | ·599 | 89·9 | 77·6 | 99·2 | 84·4 | E N E | | Cloudy. | ·694 | 88·5 | 80·2 | 96·3 | 82·4 | Variable | | Cloudy. |
| 23 | ·594 | 90·1 | 77·2 | 102·7 | 84·4 | N N E | | Light clouds. | ·726 | 84·7 | 77·5 | 93·3 | 82·4 | Variable | | Often overcast. |
| 24 | ·599 | 89·1 | 78·4 | 98·4 | 85·1 | N | | Heavy clouds. | ·741 | 87.6 | 78·1 | 94·2 | 79.7 | S W | | Cloudy. |
| 25 | ·622 | 90·0 | 79·2 | 98·9 | 82·9 | N W | | Nearly overcast. | ·737 | 85·6 | 77·8 | 96·3 | 78·4 | W S W | ·206 | Do. |
| 26 | ·631 | 90·2 | 79·6 | 97·4 | 82·9 | Variable | | Changeable. | ·703 | 84·8 | 76·7 | 96·0 | 78·2 | W N W | ·297 | Overcast. |
| 27 | ·647 | 90·5 | 80 9 | 99·0 | 84 9 | N W | | Hazy clouds. | ·668 | 82·6 | 75·2 | 89·2 | 76 6 | W | | Do. |
| 28 | ·664 | 87·6 | 81·9 | 93·9 | 83·9 | N W | | Hazy. | ·694 | 86·3 | 77·4 | 93·0 | 78·4 | W | ·008 | Do. |
| 29 | ·665 | 82·7 | 78·5 | 89·2 | 81·6 | N W | ·082 | Overcast. | ·730 | 86·0 | 76·6 | 94·0 | 78·6 | W | | Do. |
| 30 | ·637 | 86·3 | 78·5 | 93·0 | 79·2 | N N E | | Nearly overcast. | ·708 | 87·5 | 76·8 | 95·3 | 80·6 | W | | Do. |
| 31 | ·638 | 86·7 | 78·6 | 97·7 | 79·4 | W S W | | Flying clouds. | | | | | | | | |
| Means | 29·673 | 88 6 | 79·7 | 98 0 | 81 3 | W S W | 1·286 | | 29·711 | 88·1 | 77·9 | 97·9 | 81·4 | W | 0 647 | |

## Daily Results of Meteorological Observations, made at the Madras Observatory during the year 1861.

### July 1861.

| Date. | Barometer reduced to 32° Faht. | Thermometers. Means. Dry | Wet | Max. | Min | Wind. | Rain. | Weather. |
|---|---|---|---|---|---|---|---|---|
| | Inches | ° | ° | ° | ° | | Inches | |
| 1 | 29·723 | 90 1 | 75·2 | 96·3 | 82 9 | W | | Overcast. |
| 2 | ·733 | 89·6 | 76·4 | 99·2 | 84·3 | W | | Cloudy. |
| 3 | ·715 | 88·5 | 77·7 | 101·1 | 82·4 | W S W | | Do. |
| 4 | ·717 | 89·0 | 79·1 | 98.2 | 82·4 | S W | ·072 | Changeable. |
| 5 | ·733 | 89·4 | 80·7 | 99·8 | 81 7 | W S W | ·030 | Do. |
| 6 | ·719 | 87·0 | 79·3 | 100·0 | 80·7 | W S W | 1·136 | Heavy clouds. |
| 7 | ·709 | 84·8 | 79·3 | 92·3 | 76·6 | W N W | ·856 | Changeable. |
| 8 | ·688 | 84·0 | 77 6 | 89·7 | 75·4 | S W | | Do. |
| 9 | ·675 | 85·0 | 76·9 | 92·1 | 77·6 | N W | | Cloudy. |
| 10 | ·648 | 85·9 | 77·7 | 94·2 | 77·4 | W N W | | Overcast. |
| 11 | ·628 | 84·0 | 77·2 | 89·5 | 80·4 | W S W | | Do. |
| 12 | ·646 | 83·4 | 76·8 | 87·3 | 79·6 | W | | Do. |
| 13 | ·650 | 84·2 | 75·5 | 91·8 | 80·4 | W | ·016 | Do. |
| 14 | ·690 | 85·8 | 74·6 | 92·4 | 78·2 | W | | Do. |
| 15 | ·736 | 85·3 | 75·6 | 93·3 | 80 4 | W N W | 070 | Do. |
| 16 | ·718 | 85·5 | 76·2 | 93·5 | 79·6 | W N W | | Heavy clouds. |
| 17 | ·680 | 86·7 | 76·1 | 93·3 | 81·4 | W N W | | Overcast. |
| 18 | ·692 | 87·9 | 75·6 | 95·2 | 80·6 | W | ·024 | Nearly overcast. |
| 19 | ·729 | 86·7 | 76·8 | 95·9 | 80·6 | W | | Cloudy. |
| 20 | ·756 | 83·2 | 78·9 | 98 0 | 80·4 | W | ·010 | Do. |
| 21 | ·735 | 88·5 | 78·0 | 96·0 | 80·4 | W S W | | Do. |
| 22 | ·725 | 86·5 | 75·9 | 90·6 | 81·2 | W | | Overcast. |
| 23 | ·724 | 89·0 | 77·7 | 95·3 | 82 9 | W N W | | Nearly overcast. |
| 24 | ·766 | 87·8 | 76·9 | 98·0 | 81·4 | W | ·027 | Cloudy. |
| 25 | ·787 | 85·9 | 76·5 | 96 8 | 79·9 | W | | Changeable. |
| 26 | ·782 | 87·8 | 78·0 | 96·2 | 80·2 | Variable | | Hazy. |
| 27 | ·783 | 83·4 | 77·0 | 93·3 | 79·4 | S S W | | Changeable. |
| 28 | ·773 | 87·4 | 79·2 | 93·9 | 80·6 | W S W | | Chiefly fine |
| 29 | ·789 | 87·1 | 77·2 | 96·1 | 80·3 | S W | | Changeable. |
| 30 | ·742 | 86·8 | 79·4 | 94·1 | 78·2 | Variable | | Cloudy. |
| 31 | ·713 | 87·0 | 77·8 | 96·4 | 81·4 | W | ·930 | Light clouds. |
| Means | 29·719 | 86·7 | 77·3 | 94·9 | 80·3 | W | 3·171 | |

### August 1861.

| Date. | Barometer reduced to 32° Faht. | Thermometer. Means. Dry | Wet | Max. | Min | Wind. | Rain. | Weather |
|---|---|---|---|---|---|---|---|---|
| | Inches | ° | ° | ° | ° | | Inches | |
| 1 | 29·722 | 86·2 | 78·4 | 92·5 | 77·6 | N N W | ·422 | Cloudy. |
| 2 | ·766 | 82·0 | 77.8 | 90·4 | 75 6 | W S W | ·352 | Overcast. |
| 3 | ·741 | 80·5 | 77 4 | 86·5 | 75 2 | W N W | ...... | Chiefly overcast. |
| 4 | ·743 | 83·9 | 79·2 | 92·8 | 76·4 | W | ...... | Light clouds. |
| 5 | ·746 | 85 0 | 79·0 | 93·2 | 77·2 | W | ...... | Nearly fine. |
| 6 | ·752 | 85·4 | 79·1 | 91·7 | 80·0 | S | ...... | Light clouds. |
| 7 | ·746 | 85·5 | 80 0 | 90 3 | 79 6 | W S W | ·095 | Nearly fine. |
| 8 | ·732 | 84·2 | 79 0 | 93·8 | 78 4 | W | 2·316 | Changeable. |
| 9 | ·722 | 83·4 | 80·0 | 90·1 | 75·9 | W | ·563 | Cloudy. |
| 10 | ·751 | 79·2 | 78·5 | 85·3 | 74·4 | W N W | ·030 | Overcast. |
| 11 | ·772 | 79·2 | 78·3 | 84·8 | 76·4 | W S W | ...... | Do. |
| 12 | ·771 | 80·5 | 78 2 | 86·9 | 77·0 | W S W | ·018 | Do. |
| 13 | ·727 | 83·4 | 79·9 | 91·4 | 76·4 | W S W | ·010 | Do. |
| 14 | ·689 | 82·1 | 79·3 | 91.4 | 76·4 | W | ·230 | Do. |
| 15 | ·707 | 79·6 | 78·4 | 89·0 | 76·4 | W | ·290 | Do. |
| 16 | ·717 | 83·8 | 80·4 | 92·1 | 76·8 | W S W | ·004 | Heavy clouds. |
| 17 | ·726 | 84·6 | 79·8 | 93·7 | 77·9 | W S W | ...... | Overcast. |
| 18 | ·685 | 83·5 | 79 7 | 91·5 | 78·5 | W | ·310 | Nearly overcast. |
| 19 | ·661 | 85·7 | 80·1 | 92·9 | 78·1 | W | ...... | Cloudy. |
| 20 | ·710 | 86·6 | 80·7 | 94·0 | 78·4 | W S W | ..... | Nearly overcast. |
| 21 | ·753 | 84·8 | 79·2 | 95·6 | 78 2 | W S W | 1·764 | Do. |
| 22 | ·806 | 81·8 | 76·7 | 90·3 | 77·2 | W | ·139 | Overcast. |
| 23 | ·797 | 84·2 | 77 6 | 93 3 | 76·9 | W | ·123 | Changeable. |
| 24 | ·784 | 84·0 | 76 9 | 91·0 | 77·4 | W N W | ...... | Cloudy. |
| 25 | ·807 | 82·5 | 77·0 | 89·4 | 78·4 | W N W | ...... | Overcast. |
| 26 | ·791 | 85·0 | 78·4 | 94·9 | 78 4 | W | ·307 | Changeable. |
| 27 | ·783 | 84·1 | 78·0 | 92·2 | 79·1 | W | ...... | Chiefly overcast. |
| 28 | ·753 | 83·7 | 77·2 | 93·3 | 80·4 | W N W | ·200 | Do. |
| 29 | ·740 | 81·5 | 76·7 | 91·9 | 77 9 | W N W | ·710 | Overcast. |
| 30 | ·748 | 84·2 | 76·9 | 91·4 | 78 2 | W | ...... | Cloudy. |
| 31 | ·741 | 84·0 | 77·1 | 90·3 | 78 6 | W | ...... | Do. |
| Means | 29·745 | 83·4 | 78·5 | 91·2 | 77·5 | W | 7·883 | |

*Daily Results of Meteorological Observations, made at the Madras Observatory during the year* 1861.

SEPTEMBER 1861.

| Date. | Barometer reduced to 32° Faht. | Thermometers. Means. Dry. | Wet | Max. | Min | Wind. | Rain. | Weather. |
|---|---|---|---|---|---|---|---|---|
| | Inches | ° | ° | ° | ° | | Inches | |
| 1 | 29·707 | 85·9 | 77·6 | 93·1 | 79·4 | W N W | | Changeable. |
| 2 | ·701 | 87·0 | 77·4 | 94·2 | 80·6 | W N W | | Light clouds. |
| 3 | ·728 | 83·9 | 76·9 | 96·1 | 78·6 | W N W | | Hazy. |
| 4 | ·716 | 83·9 | 77·8 | 96·1 | 79·4 | W N W | ·010 | Changeable. |
| 5 | ·739 | 85·0 | 76·9 | 95·4 | 79·4 | N W | | Flying clouds. |
| 6 | ·759 | 85 1 | 77·9 | 95·6 | 79·4 | N W | | Chiefly fine. |
| 7 | ·753 | 85·5 | 78·2 | 93·1 | 79·4 | W S W | | Hazy. |
| 8 | ·761 | 85·8 | 77·6 | 93·3 | 79·7 | W S W | | Fine. |
| 9 | ·746 | 86.8 | 78·5 | 93·6 | 78·4 | W S W | | Light haze. |
| 10 | ·743 | 85·9 | 78·1 | 92.1 | 79·4 | Variable | | Fine. |
| 11 | ·772 | 86·4 | 79·3 | 92·3 | 79.7 | S | | Do. |
| 12 | ·810 | 86·0 | 78·9 | 94·4 | 80·2 | W S W | | Cloudy. |
| 13 | ·814 | 85·5 | 79·2 | 95·4 | 78·4 | N W | ·202 | Heavy clouds. |
| 14 | ·810 | 79.9 | 77·5 | 91·6 | 75.4 | N N W | ·513 | Changeable. |
| 15 | ·767 | 80·0 | 77·1 | 87·5 | 74·6 | N | 1·790 | Dull and stormy. |
| 16 | ·749 | 81·3 | 78·8 | 86·4 | 75·4 | N N W | 1·220 | Do |
| 17 | ·754 | 84·1 | 80·7 | 90·6 | 78·0 | N | ·049 | Dull but calm. |
| 18 | ·809 | 80·1 | 79·2 | 91·2 | 77·4 | N W | 1·906 | Chiefly overcast. |
| 19 | ·799 | 80·6 | 78·2 | 90·0 | 75·2 | N W | 1·235 | Stormy. |
| 20 | ·759 | 81·7 | 78·4 | 89·5 | 74·6 | N N W | ·305 | Cloudy. |
| 21 | ·749 | 84·0 | 78·6 | 89·5 | 75·9 | N W | ·520 | Changeable. |
| 22 | ·803 | 79·8 | 77·6 | 85·9 | 78·3 | W S W | ·385 | Do. |
| 23 | ·801 | 77·0 | 76·6 | 86·2 | 76·4 | W S W | ·134 | Do. |
| 24 | ·791 | 79·3 | 76·5 | 89·5 | 75·9 | N N W | ·690 | Cloudy. |
| 25 | .788 | 80·4 | 77·1 | 88·5 | 76·1 | N N W | ·157 | Overcast. |
| 26 | ·812 | 76·7 | 74·6 | 85·9 | 75·2 | W N W | ·140 | Do. |
| 27 | ·806 | 80·4 | 77·1 | 86·3 | 75·4 | N N W | | Cloudy. |
| 28 | ·757 | 83·3 | 78·2 | 86·4 | 76·4 | W N W | | Do. |
| 29 | ·721 | 83·6 | 78·5 | 88·7 | 77·4 | W | | Chiefly overcast. |
| 30 | ·717 | 85·4 | 79·1 | 91·8 | 78·0 | W N W | | Hazy and dull. |
| 31 | | | | | | | | |
| Means | 29·765 | 83·0 | 77·9 | 91·0 | 77·6 | W N W | 9·256 | |

OCTOBER 1861.

| Date. | Barometer reduced to 32° Faht. | Thermometers. Means. Dry. | Wet | Max. | Min | Wind. | Rain. | Weather. |
|---|---|---|---|---|---|---|---|---|
| | Inches | ° | ° | ° | ° | | Inches | |
| 1 | 29·748 | 85·7 | 76·9 | 92·3 | 79·8 | W S W | | Cloudy. |
| 2 | ·749 | 85·0 | 77·1 | 93·1 | 80·3 | W N W | | Do. |
| 3 | ·793 | 85·8 | 78·7 | 95·0 | 79·2 | N W | ·022 | Light clouds. |
| 4 | ·779 | 86·2 | 79·4 | 93·3 | 77·9 | N W | | Flying clouds. |
| 5 | ·760 | 87·1 | 77·7 | 94·8 | 77·4 | W N W | | Cloudy. |
| 6 | ·778 | 84·9 | 77·4 | 93·3 | 78·4 | N W | | Hazy. |
| 7 | ·797 | 85·1 | 77·8 | 91·6 | 78·4 | Variable | | Nearly fine. |
| 8 | ·838 | 84·8 | 77·3 | 92·1 | 77·4 | N W | | Fine. |
| 9 | .806 | 85·3 | 76·4 | 93·3 | 77·8 | N W | | Hazy. |
| 10 | ·804 | 84·6 | 75·6 | 92·5 | 78·2 | N N W | | Cloudy. |
| 11 | ·837 | 84·6 | 75·3 | 92·3 | 76.5 | N N E | | Light haze. |
| 12 | ·861 | 84·8 | 78·2 | 91·8 | 75·5 | S S E | | Fine. |
| 13 | ·865 | 86·1 | 78·7 | 93·2 | 77·9 | S W | | Cloudy. |
| 14 | ·879 | 85·1 | 79·2 | 90·9 | 79·8 | S S W | | Hazy. |
| 15 | ·823 | 83·7 | 78·5 | 92·2 | 79·2 | S S E | | Cloudy. |
| 16 | ·850 | 84·7 | 78·8 | 93·3 | 77·9 | S S E | ·008 | Hazy. |
| 17 | ·841 | 85·3 | 77·3 | 94·0 | 78·4 | N N W | | Do. |
| 18 | ·884 | 84·7 | 76·5 | 91·6 | 77·4 | N E | | Light haze. |
| 19 | ·880 | 84·5 | 73·4 | 92·2 | 76·2 | N N E | | Changeable. |
| 20 | ·848 | 78·6 | 74·7 | 82·4 | 74·9 | N N W | ·575 | Overcast. |
| 21 | ·869 | 82·9 | 77·9 | 87·5 | 75·4 | S E | | Flying clouds |
| 22 | ·918 | 82·3 | 77·7 | 86·3 | 76·1 | E N E | ·585 | Cloudy. |
| 23 | ·922 | 81·1 | 77·0 | 86·1 | 75·9 | N E | ·039 | Do. |
| 24 | ·904 | 82·2 | 76·1 | 86·8 | 76·4 | E N E | | Do. |
| 25 | ·891 | 80·6 | 76·6 | 86·5 | 76·2 | E N E | ·305 | Heavy clouds. |
| 26 | ·894 | 82·4 | 77·2 | 86·6 | 75·9 | E N E | ·009 | Light clouds. |
| 27 | ·879 | 80·2 | 75·9 | 86·1 | 75·4 | N E | | Hazy. |
| 28 | ·866 | 80·9 | 76.1 | 87·4 | 75·9 | N N E | | Cloudy. |
| 29 | ·876 | 81·8 | 75·2 | 86·6 | 76·6 | N N E | | Hazy. |
| 30 | ·873 | 81·1 | 74·5 | 87·1 | 74·6 | N N E | | Light clouds. |
| 31 | ·850 | 81·5 | 74·4 | 86·8 | 74·4 | N N E | | Do. |
| Means | 29·844 | 83·7 | 76·9 | 90·3 | 77·1 | N | 1·543 | |

## Daily Results of Meteorological Observations, made at the Madras Observatory during the year 1861.

### November 1861.

| Date. | Barometer reduced to 32° Faht. | Thermometers. Means. Dry. | Wet | Max. | Min | Wind. | Rain. | Weather. |
|---|---|---|---|---|---|---|---|---|
| | Inches | ° | ° | ° | ° | | Inches | |
| 1 | 29·841 | 81·0 | 74·9 | 86.6 | 75·4 | N N E | | Chiefly overcast. |
| 2 | ·860 | 76·6 | 76·0 | 83·8 | 74·2 | N. | 1·364 | Overcast. |
| 3 | ·873 | 77 9 | 75·3 | 86 8 | 74·0 | N | ·967 | Stormy. |
| 4 | ·803 | 75 1 | 74·6 | 81·4 | 74·6 | N N E | 1·396 | Overcast. |
| 5 | ·736 | 78·8 | 75·8 | | 74·4 | N N E | ·178 | Do. |
| 6 | ·653 | 70·3 | 70·1 | 75·7 | 70 7 | N W | 4·982 | Do. |
| 7 | ·670 | 73·2 | 73·2 | 81·7 | 70·2 | W N W | 1·037 | Do. |
| 8 | ·711 | 79 0 | 76·9 | 83·7 | 70·4 | S S W | ·505 | Heavy clouds. |
| 9 | ·780 | 79·6 | 77·0 | 88·2 | 76·4 | S W | ·460 | Chiefly overcast. |
| 10 | ·803 | 78·5 | 77·1 | 88·1 | 76·0 | S W | 1·105 | Cvercast. |
| 11 | ·797 | 79·0 | 76·8 | 86·3 | 74·8 | Variable | ·090 | Nearly overcast. |
| 12 | ·829 | 79·5 | 77 1 | 84·7 | 73 6 | Variable | | Cloudy. |
| 13 | .817 | 79 9 | 77·6 | 86·4 | 76·4 | S E | 220 | Do. |
| 14 | ·859 | 76·8 | 75·0 | 80 0 | 76·0 | N | | Do. |
| 15 | ·861 | 76·9 | 72 8 | 84·6 | 73·4 | N N W | | Do. |
| 16 | ·885 | 75.4 | 70 9 | 82 6 | 70·4 | N N W | | Light clouds. |
| 17 | ·927 | 75 4 | 71·1 | 82 5 | 68·7 | N W | | Nearly fine. |
| 18. | ·969 | 75·6 | 70 7 | 82 9 | 66·4 | N W | | Light haze. |
| 19 | ·962 | 76·7 | 71·0 | 82 6 | 67·4 | N | | Do. |
| 20 | ·969 | 76·2 | 71·4 | 82 5 | 68·4 | N N E | | Cloudy. |
| 21 | .993 | 76·9 | 70·3 | 81.5 | 68·9 | N N E | | Do. |
| 22 | 30 004 | 76·7 | 71·5 | 81·4 | 71·4 | N | | Heavy clouds. |
| 23 | ·005 | 76·8 | 71·6 | 81·6 | 72·9 | N N E | | Fine. |
| 24 | 29 999 | 76·2 | 72·1 | 81·4 | 69·4 | N N E | | Hazy. |
| 25 | ·998 | 77·4 | 74·3 | 83 7 | 70·8 | N N E | | Light clouds. |
| 26 | 30·014 | 76·7 | 74·1 | 80 4 | 73·6 | N N E | | Cloudy. |
| 27 | ·023 | 76.6 | 72·3 | 81·5 | 70·4 | N N E | | Light haze. |
| 28 | 29·996 | 74·7 | 69 9 | 80·6 | 70 4 | N N E | | Fine. |
| 29 | 30 001 | 73·7 | 69 9 | 79 9 | 65·6 | N N E | | Light clouds. |
| 30 | ·005 | 75·7 | 72 7 | 81·0 | 66·2 | N N E | | Changeable. |
| 31 | | | | | | | | |
| Means | 29·888 | 76 8 | 73·5 | 82·9 | 71·7 | Y | 12·304 | |

### December 1861.

| Date. | Barometer reduced to 32° Faht. | Thermometers. Means. Dry. | Wet | Max. | Min | Wind. | Rain | Weather. |
|---|---|---|---|---|---|---|---|---|
| | Inches | ° | ° | ° | ° | | Inches | |
| 1 | 30·018 | 76 6 | 74·8 | 81 8 | 71·4 | N E | | Heavy clouds. |
| 2 | ·013 | 75.8 | 74·0 | 81·4 | 74·4 | N E | | Overcast. |
| 3 | 29·991 | 74·8 | 74 0 | 80·6 | 70·9 | N N E | | Nearly fine. |
| 4 | ·989 | 74·8 | 73·3 | 80·3 | 68·4 | N | | Light haze. |
| 5 | ·983 | 76·8 | 75·7 | 82·7 | 69·4 | N N E | | Fine. |
| 6 | 30·018 | 78·4 | 76·6 | 83·5 | 72 8 | N E | | Changeable. |
| 7 | 29·998 | 77·6 | 76·6 | 82·9 | 72·2 | N E | | Do. |
| 8 | ·993 | 77·2 | 77·1 | 83·5 | 70 9 | N E | ·040 | Do. |
| 9 | 30 008 | 76·2 | 74·5 | 82.8 | 72·2 | E N E | | Light clouds. |
| 10 | 29·997 | 75·2 | 73 6 | 83·6 | 68·4 | N N E | | Changeable. |
| 11 | ·949 | 74 8 | 73·4 | 83.5 | 67·8 | E | | Chiefly fine. |
| 12 | ·919 | 75 0 | 73·7 | 81·5 | 67·2 | S E | | Fine. |
| 13 | ·932 | 75·5 | 74·1 | 82 0 | 67·6 | E | | Hazy clouds. |
| 14 | ·959 | 76·6 | 74 9 | 83·0 | 69·2 | E N E | | Chiefly fine |
| 15 | ·947 | 77 6 | 76·5 | 84·1 | 69 6 | E N E | | Fine. |
| 16 | ·929 | 76·7 | 74 9 | 82 8 | 70·6 | E N E | | Nearly fine |
| 17 | ·921 | 77·3 | 75·6 | 82·5 | 69·4 | N E | | Fine. |
| 18 | ·952 | 77·3 | 74·7 | 83·4 | 69·4 | N E | | Light clouds. |
| 19 | ·965 | 76·8 | 72 2 | 82.6 | 70·4 | N E | | Dull. |
| 20 | ·970 | 76 0 | 69·1 | 82.1 | 68·9 | N E | | Cloudy. |
| 21 | 30·010 | 77·0 | 69·4 | 81·8 | 68·1 | E N E | | Do. |
| 22 | 29·998 | 75·7 | 68 6 | 81·9 | 70·6 | N E | | Changeable. |
| 23 | ·999 | 75·7 | 67·3 | 82·8 | 67·6 | N N E | | Chiefly fine. |
| 24 | ·990 | 76·6 | 67·5 | 81·4 | 69·3 | N E | | Cloudy. |
| 25 | 30·004 | 75·9 | 67·6 | 81·4 | 71·4 | N E | | Changeable. |
| 26 | ·016 | 75·7 | 67·4 | 82·1 | 66·4 | N E | | Do. |
| 27 | ·044 | 75·3 | 68·2 | 81·1 | 66·0 | N E | | Cloudy. |
| 28 | ·000 | 73·9 | 67·0 | 81·1 | 68·9 | E N E | | Hazy. |
| 29 | 29·978 | 74·0 | 67·8 | 80·9 | 65.4 | E N E | | Chiefly fine. |
| 30 | 30·013 | 75.5 | 68 4 | 81·6 | 71·8 | N E | | Flying clouds. |
| 31 | 29 975 | 76·5 | 67 7 | 81·8 | 69·4 | N N E | | Do. |
| Means | 29 983 | 76 1 | 72·1 | 82·2 | 69·5 | N E | 0·040 | |

The highest reduced reading of the Barometer throughout the year was 30.067, on January 1. The lowest was 29.594, on May 23. The mean annual pressure was 29.828 inches; being 0.016 less than the average of twenty years past.

The greatest heat registered by a Thermometer placed in the full sunshine was 128°·5, on May 9. The highest temperature in the shade was 107°·5, on May 12; the lowest, 63°·1, on the morning of February 16. The mean temperature of the whole year was 82°·2; being 0°·9 above the twenty year average. That of evaporation, as shewn by a wet bulb thermometer, was 75°·9, being 1°·2 above the average. The mean daily range of temperature was 14°·4.

Rain fell on 72 days. The greatest fall on any one day in the year was 4·98 inches, on November 6. There were twelve days on which the quantity measured exceeded one inch. The total fall during the year was 37·16 inches; being 11·47 less than the usual quantity, or only 76 per cent of the average of 52 years.

The wind, as registered by Osler's Anemometer, was variable *i. e.* too unsteady for any resultant to be satisfactorily deduced, on 14 days. The remaining 351 days were distributed amongst the sixteen principal point of the compass as in the subjoined table :—

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| N .... | 10 | E .... | 13 | S .... | 35 | W .... | 37 |
| N N E.... | 27 | E S E .... | 6 | S S W .... | 22 | W N W.... | 30 |
| N E .... | 24 | S E .... | 11 | S W .... | 20 | N W .... | 21 |
| E N E.... | 36 | S S E .... | 18 | W S W.... | 29 | N N W.... | 12 |

No remarkable storm or other unusual meteorological phenomenon occurred at Madras throughout the year 1861.

NORMAN ROBERT POGSON,

*Government Astronomer.*

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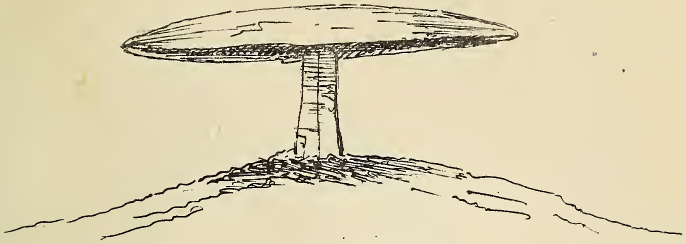
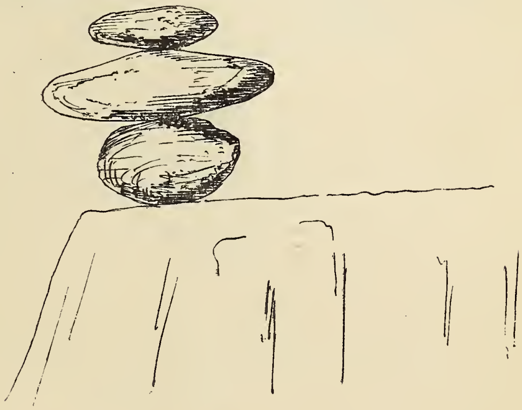
BRITISH MUSEUM NATURAL HISTORY

Gromlech in Malabar.



The Turks' head at Courtallum.



The Cheese Wring in Cornwall.

PHAROAH & C°. _ MADRAS.

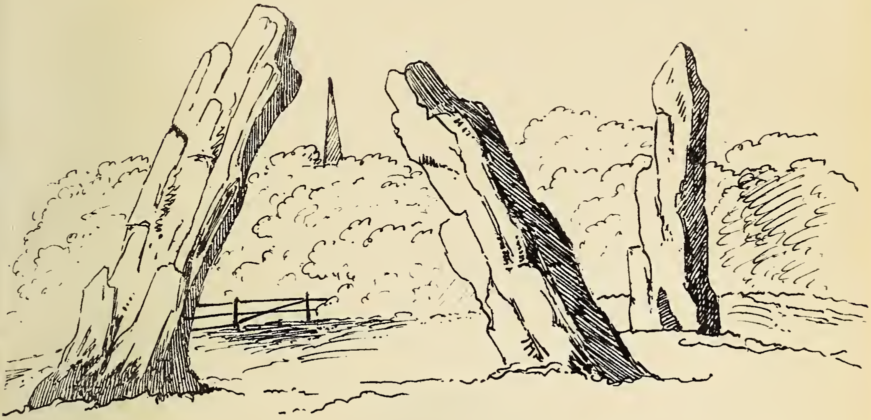
Barren & Sinclair Lith. 1861.

BRITISH
NATURAL HISTO

UPRIGHT STONES.

*Druidic Stones near Treleck in Monmouthshire.*

*The longest is 15 Feet.*



*Upright Stones at Pallipolliam in Salem.*

*18 Feet high.*

PHAROAH & C°. MADRAS.

*Barren & Sinclair Lith. 1861.*